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THE REINDEER AND ITS DOMESTICATION

BY
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THE REINDEER AND ITS DOMESTICATION

BY

BERTHOLD LAUFER

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ANALYSIS

THE REINDEER AND ITS DOMESTICATION

By BERTHOLD LAUFER

THE domestication of the reindeer has not yet been satisfactorily expounded. Some interesting though brief essays on the subject have been contributed by scholars engaged in the research of animal domestication,—first of all, by E. Hahn,¹ in his admirable work *Die Haustiere*, whose chapter on the reindeer is the best hitherto written; then follow C. Keller,² R. Müller,³ L. Reinhardt,⁴ and M. Hilzheimer.⁵ These various contributions are useful as far as they go; but what we miss in them, above all, are the historical and ethnographical points of view, and the exploitation of the abundant material accumulated by ethnographers who have had occasion to study reindeer-breeding tribes at close quarters. The Russian explorers of Siberia occupy here the first place; and it was one of the writer's chief aims to avail himself of their data, as far as this literature is accessible to him. While the observations of ethnographers working in the field are of prime importance, the interpretations of their data must occasionally be subjected to certain modifications, not all ethnographers being sufficiently schooled in the problems of domestication, or familiar with the methods and results of that science. The novel feature of the present investigation lies in the fact that here for the first time early Chinese sources relative to the domesti-

¹ *Die Haustiere und ihre Beziehungen zur Wirtschaft des Menschen, eine geographische Studie* (Leipzig, 1896), pp. 262–267. Compare the same author's "Die Transportiere in ihrer Verbreitung und in ihrer Abhängigkeit von geographischen Bedingungen," *Verhandlungen des XII. Deutschen Geographentages in Jena* (1897), pp. 186–187.

² *Naturgeschichte der Haustiere* (Berlin, 1905), pp. 198–202; *Stammesgeschichte unserer Haustiere* (Leipzig, 1909), p. 93; also in Kraemer's *Der Mensch und die Erde*, vol. 1, p. 257.

³ *Die geographische Verbreitung der Wirtschaftstiere* (Leipzig, 1903), pp. 137–148.

⁴ *Kulturgeschichte der Nutztiere* (München, 1912), pp. 228–237.

⁵ *Die Haustiere in Abstammung und Entwicklung*, pp. 72–73.

cated reindeer are laid under contribution, and that an effort has been made to determine the origin of the domestication more precisely as to time and space. The writer attempts to answer three questions, as far as this is possible in the present state of science:—When did the primeval domestication originate? Where was the center of it, and how did it propagate from this center to other culture areas? What was the process that brought the primeval domestication about?

At the outset two current popular notions connected with the Old-World reindeer should be banished,—that the reindeer is exclusively an inhabitant of the tundra of northern Europe and Asia, and that it is employed exclusively by the peoples inhabiting the northern littorals of Europe and Asia. The reindeer haunts the woods of high mountainous districts as well, and thrives in the forests of the Ural and Baikal regions. The records referring to the woodland reindeer are much older than those pertaining to the tundra reindeer of the maritime coasts. It will be seen that in all likelihood we have to assume an historical relation between the two varieties; that is to say, the woodland reindeer is the first in point of time that was domesticated, and spread from southern into northern regions, gradually developing into the tundra reindeer through infusion with the blood of wild forms of the tundra. The wild reindeer has the same southern expansion: it abounds in the extensive woods of the governments Vyatka and Perm and in the adjoining northern portion of Kazan, in Russia. Entire herds formerly migrated from the Ural into the afforested region between the Kama and Ufa (56° N. lat.), even as far as the southern woodland boundary line, almost as far as 52° N. lat.¹ The Bashkir hunt the animal along the Ufa under 55° N. lat.

¹ J. F. Brandt, *Zoogeographische und palaeontol. Beiträge* (St. Petersburg, 1867), p. 65. See also A. Nehring, *Ueber Tundren und Steppen der Jetzt- und Vorzeit* (Berlin, 1890), pp. 31, 108. P. S. Pallas (*Reise durch verschiedene Provinzen des russischen Reichs*, vol. III, p. 470) reported in 1773, "In the fir-tree woods on the Ufa and throughout the woodlands as far as the Kama, there are, aside from other deer, still many wild reindeer (in Bashkir *yuśá*), frequently wandering in large herds, and, judging from the antlers I saw, somewhat smaller than the northern ones."

HISTORICAL NOTES

The first and most prominent fact about the domesticated reindeer is that it is entirely lacking in aboriginal America (the artificial introduction into Alaska is of very recent date), and represents an exclusive cultural property of the Old World. North America abounds in wild reindeer (known as caribou) and elk or moose; but the native population only hunted these animals, and never made any endeavor to domesticate them. Consequently the Old-World domestication cannot be *a priori* of very ancient date, but was accomplished only at a late time, when the population of America was settled. This consideration will be amply confirmed by the history of the domestication.

Certain it is that the classical authors have left us no account whatever of the domesticated reindeer. The Danish archaeologist G. F. L. Sarauw¹ has made a very interesting study of the information contained in the writings of the ancients in regard to elk and wild reindeer, but there is complete silence as to tamed forms. Hahn² is quite right in maintaining that the Greeks were not so unfamiliar with the north of eastern Europe that such a striking phenomenon as the tamed harts should not have been known among them in one form or another, had they existed at the time; but all observations of the ancients strictly refer to wild forms. This state of affairs meets its parallel among the Chinese. They were well acquainted with the host of tribes living in the north and northwest of their country, but in no Chinese author of the pre-Christian era do we meet with a single notice of the reindeer. Only at the end of the fifth century A.D. did tidings of a tame stag, used for drawing sledges and for milking, reach the ears of the Chinese. It is well known that the wild reindeer was among the game hunted by paleolithic man of western Europe. There is no evidence that he ever attempted to domesticate this animal. Its domestication manifestly falls within historical times; and, if so, there must be some way of calculating by historical methods more

¹ "Das Rentier in Europa zu den Zeiten Alexanders und Caesars," published in *Mindeskript for Japetus Steenstrup* (København, 1913); 34 p., 4°.

² *Haustiere*, p. 263.

exactly the *terminus a quo*. The students of domestication have usually regarded that of the reindeer as a comparatively recent event, and as the most recent of all domestications; but their impressions naturally have remained of a somewhat vague character. C. Keller¹ remarks:

The passage into the state of domesticity cannot have taken place at an early date, since neither specific races have as yet been formed, nor is the submissiveness to man much developed. The herds graze wherever it suits them; and the business of milking is very complex, as the cows behave stubbornly.

L. Reinhardt² has expressed the following opinion:

The reindeer was elevated by man into a domesticated animal at a very late period, and generally is still domesticated very deficiently. The time when this happened can no longer be determined; however, it cannot have taken place much earlier than five hundred years ago.

This figure is far too low, and must be multiplied at least by three, as we have Chinese allusions to the domestic reindeer dating in the fifth century A.D. Even without such historical data, Reinhardt's calculation would hardly be acceptable, as the wide geographical distribution of the reindeer would argue in favor of a much earlier domestication. M. Wilcken's assertion³ that the domestication of the reindeer took place in prehistoric times misses the mark entirely.

The earliest reference to tame reindeer in western sources is contained in the famous narrative of the Norseman Ohthere, who "said to his lord, King Alfred, that he dwelt farthest north of all Northmen." Ohthere, of whom we unfortunately know very little, was born in Haloga (Helge)-land in Norway, and undertook in A.D. 890 several voyages, one of which was from Norway toward the extreme northern coasts. In the course of his travelings he rounded the North Cape, discovered the White Sea, where he reached the south coast of the Kola Peninsula, and became acquainted with the Finn and Biarmians (Beormas) or Permians in the northeast of European Russia. The memorable account of

¹ H. Kraemer, *Der Mensch und die Erde*, vol. I, p. 257.

² *Kulturgeschichte der Nutztiere*, p. 232.

³ *Grundzüge der Naturgeschichte der Haustiere* (2d ed. by J. U. Duerst), (Leipzig, 1905), p. 172.

his expeditions was included by Alfred the Great in his Anglo-Saxon translation of the *Hormista* of Paulus Orosius.¹ Here we read as follows:

He [Ohthere] was a very rich man in those possessions in which their wealth consists, that is, in wild animals. He still had when he came to the king six hundred tame deer unsold. These deer they call 'reindeer;' six of them were decoy-deer; these are much prized among the Finn, because they capture the wild deer with them. He ranked with the foremost men in the land, though he had not more than twenty cattle, twenty sheep, and twenty swine; and the little that he ploughed he ploughed with horses.²

Schlözer³ and I. A. Sjögren,⁴ taking the term "Finn" in Ohthere's narrative in the sense of "Lapp," have advanced the theory that he lived among Lapp and spoke their language,⁵ and that it was Laplanders, who cared for his reindeer purchased from them. This theory is baseless, and we gain nothing from it. Whether Ohthere had obtained his reindeer from Lapp or Finn or Scandinavians, or had captured them himself, his story can prove little or nothing along the line of domestication; at best, it shows the very first stage necessary in reaching this object. All members of the family *Cervidae* may easily be driven into enclosures and kept there indefinitely, for which many examples will be cited hereafter. Ohthere does not state that he made any practical

¹ The original manuscript of Alfred's work, beautifully written, is preserved in the Cottonian collection of manuscripts in the British Museum. It was first published by Daines Barrington under the title, *The Anglo-Saxon Version from the Historian Orosius*, by Alfred the Great. Together with an English translation from the Anglo-Saxon (London, 1773).

² J. McCubbin and D. T. Holmes, *Orosian Geography*, p. 8. J. Bosworth, *Description of Europe and the Voyages of Ohthere and Wulfstan*, written in Anglo-Saxon by King Alfred the Great, p. 12, translates: "He had, moreover, when he came to the King, six hundred tame deer of his own breeding." The Anglo-Saxon text of the above passage runs as follows: "þā dēor hī hātað 'hrānas; þāra wāron syx stæl-hrānas; ðā bēoð swyðe dýre mid Finnum, for ðæm hý fōð þā wildan hrānas mid."

³ *Allgemeine nordische Geschichte*, p. 445.

⁴ *Gesammelte Schriften*, vol. I, p. 314.

⁵ This point is rather doubtful. All that Ohthere himself tells us in point of language amounts to this: "The Permians told him many stories both of their own land and of the lands which were around them, but he did not know how much was truth as he did not see it himself. It seemed to him that the Finn and the Permians spoke nearly the same language." This observation does not lend itself to far-reaching conclusions.

use of his deer. In all probability, it was merely the venture of a sportsman, who had an aesthetic pleasure in the animals, like a park-owner in fallow deer. Ohthere's account stands perfectly isolated: we read no more about tame reindeer during or after his time. Only as late as the fifteenth century do we hear for the first time about domesticated reindeer from Russian sources. If at Ohthere's time the Finn or the Lapp had really possessed the reindeer, we should justly expect to find it mentioned in the *Kalewala*; but this is not the case. The songs of the *Kalewala* know only of the elk and the wild Tarandus.

It is stated by Hahn¹ that, according to Lehrberg, in 1499 the Samoyed, besides dog-sleighs, had reindeer on the backs of which they used to ride. C. Keller² has adopted this from him, and the "fact" has finally been popularized in H. Kraemer's *Der Mensch und die Erde*.³ It is striking, of course, that the Samoyed should have mounted reindeer in 1499, while they never did so at any later time, nor do so at present. In fact, the reindeer is ridden only by the Soyot and Tungus, not, however, by any western tribes.⁴ Thus suspicion is ripe that there may be some misunderstanding of the original Russian source on which this deduction is based. Lehrberg's work in the original German is not within my reach,⁵ but I have access to a Russian translation of it and to the Russian document on which his data are based. This is reprinted in Shčseglov's *Chronological Review of Important Data from the History of Siberia*,⁶ and relates to the year 1499. In order to

¹ *Haustiere*, p. 265.

² *Naturgeschichte der Haustiere*, p. 201.

³ Vol. I, p. 257. Here we even read the absurdity that "the oldest accounts of tame reindeer come from Lehrberg, who in 1499 observes that the Samoyed ride on them,"—a complete misunderstanding.

⁴ Hahn himself was struck by this anomaly, stating farther on (p. 266) that "this exception would seem doubtful to him until further confirmation were received."

⁵ The work of A. C. Lehrberg bears the title *Untersuchungen zur Erläuterung der aelteren Geschichte Russlands* (St. Petersburg, 1816). An interesting analysis of his researches has been given by Klaproth, *Mémoires relatifs à l'Asie*, vol. I (Paris, 1824), pp. 116-146.

⁶ I. V. Shčseglov, *Xronologičeski perežen' važn'üšix dannyx iz istorii Sibiri 1032-1882* (Irkutsk, 1883), p. 12, published by the East-Siberian Section of the Imperial Russian Geographical Society.

understand these events, it is necessary to premise that Ivan the Great (1462-1505), after destroying the liberty of Novgorod, began the conquest of northern Russia, and in that year the Russians completed the subjugation of what was called by them Yugra; that is, the territory of the Ural Mountains, inhabited by Wogul and other Ugrian tribes, and formerly under the jurisdiction of the Republic of Novgorod, in the documents of which Yugra is mentioned as early as 1264. The expedition of 1499 was conducted under the command of the Prince Semyón Fedorovič Kurbski, Prince Pyotr (Peter) Fedorovič Ušati and Vasili Ivanovič Zabolotski-Bražnik. This enterprise is described in detail in the synchronous Russian documents, the result being given thus:

The military chiefs (*voyevody*) slew fifty men of the Samoyed¹ on the rock,² and captured two hundred reindeer. From this Rock they marched for a week as far as the first town, L'apino,³ covering altogether 465 *verst* over this territory. Proceeding from L'apino, they met the Yugor princes who came on reindeer from Obdor;⁴ but from L'apino the [Russian] military chiefs (*voyevody*) traveled on reindeer; the army, however, on dogs.

This is a literal translation, and in the spirit of the Russian language means that they traveled on sledges drawn by reindeer and dogs respectively. The same verb, *š'li* ("they went"), is used with the reindeer and with the dogs (*na olen'ax, a rat na sobakax*); and,

¹ The land of the Samoyed, under the name Samoyad', is mentioned as early as 1096 in the chronicle of Nestor as being situated north of Yugra. In 1246 their name is mentioned by Plano Carpini, who styles them "Samogedes," and ascribes to them dog-heads, as the ancient legend of the *κυνοκέφαλοι* was alive in his day. The name may be related to Sameyadna, which the Lapp (in Russian Lop', Lopari) confer on their country.

² The Rock (Kamen'), also Rocky Girdle (Kamennyi Poyas), is a designation of the Ural, in accordance with the Ostyak term *keu, kev* ("stone, mountain, Ural"). See B. Munkácsi, *Keleti Szemle*, vol. III (1902), p. 276.

³ Small place (also L'apina) on the banks of the Sygwa in the district (*okrug*) Berezov, now called Vorulsk. The Sygwa is a side-river of the northern Soswa, which falls into the Ob not far from Berezov.

⁴ The original document has the misprint Odor. The question is of Obdor province (*Obdorskaya oblast'*) on the lower Ob. The settlement Obdor is situated not far from the mouth of the Ob. According to A. Castrén, *Reiseerinnerungen aus den Jahren 1838-1844*, p. 279, who has given a very interesting description of the place, this name should be of Syryän origin, meaning "mouth of the Ob." An account of Berezov and Obdorsk is found also in P. S. Pallas, *Reise durch verschiedene Provinzen des russischen Reichs*, vol. III, pp. 17-24. Reindeer are still kept in this region.

since it cannot be supposed that the soldiers rode astride dogs, it is equally out of the question that riding on reindeer is understood.¹ The Samoyed have nothing whatever to do with this affair; the Russian documents of that period clearly distinguish between Yugra and Samoyed, and the situation is perfectly clear. It was the Yugor (Yugrian, Ugrian) princes (*Yugorskie kn'azi*) who were in possession of reindeer-sledges, in the same manner as their Wogul descendants are at the present time. These were duly captured by their Russian conquerors and placed at the disposal of the commanders on their further inroads into the Ugrian territory, while the soldiers were transported on dog-

¹ The Russian text is by no means ambiguous. If the Russian writer meant to express "riding," he would have used the verb *yāxal' verxom*. The usual question addressed to the winter traveler in Siberia on his arrival is, "In what way did you come?" which is answered by such phrases as, "On horses" (*na lošad'ax* or *kon'ax*), "On dogs" (*na sobakax*), "On reindeer" (*na olen'ax*); and it is perfectly understood that he traveled on a sledge drawn by horses, dogs, or reindeer. In the same manner Avril, *Travels into Divers Parts of Europe and Asia* (London, 1693), p. 161, says in regard to the Samoyed that "they travel upon harts and dogs." The text of Lehrberg (in the Russian translation, p. 14) is quite clear. "Iz L'apina na vstr'āču Russk'im v'āxali Yugorskiye kn'az'ya na olen'ax. L'apino zavoyevano, i ot s'uda voisko pošlo dal'āye, voyevody na olen'ax, a prochie na san'ax, zapr'āžennyx sobakam'i." Lehrberg comments in a note that traveling with dogs was in full swing on the Irtysh as early as 1580, and is still practised in northwestern Siberia, horses not being kept under 62° N. lat.; that formerly also west of the Ural in Perm dogs were employed for transportation, in more ancient times even farther west along the Baltic Sea, as shown by the Esthonian and Finnish phrase for "mile," *penni koorm, penicuorma* (literally, "dog-load"). Karamzín (*Istoriya gosudarstva rossiskago*, St. Petersburg, 1819, vol. vi, p. 286), the eminent Russian historian, has interpreted the document in the same manner by saying, "Each of these princes sat in a long sledge drawn by reindeer. The voyevody of John likewise drove on reindeer (*yāxali na olen'ax*), but the soldiers on dogs (*na sobakax*), holding in their hands fire and sword for the annihilation of the poor inhabitants." Regarding the Russian expedition of 1499 see also Sjögren, *Gesammelte Schriften*, vol. i, p. 309; and Aleksandra Dmitrieva, "Pokorenie ugarskix zemel'i Sibiri," pp. 87 et seq., *Permskaya Starina* (Perm, 1894), no. v. In A. Rambaud's *History of Russia* (Boston, 1886), vol. i, p. 221, this event is thus narrated: "In 1499 the voyevodi of Ustiug, of the Dwina, and of Viatka advanced as far as the Petchora, and built a fortress on the banks of the river. In the depth of winter, in sledges drawn by dogs, they passed the defiles of the Urals, in the teeth of the wind and snow, slew fifty of the Samoyedi, and captured two hundred reindeer; invaded the territory of the Voguli and Ugrians, the Finnish brethren of the Magyars; took forty enclosures of palisades, made fifty princes prisoners, and returned to Moscow, after having reduced this unknown country." Here the transportation on reindeer-sleighs as too unimportant or troublesome to the historian has been passed over in silence,—a curious example of history-writing.

sleighs. Let us hope that "the reindeer-riding Samoyed of 1499" will thus remain buried never to rise again. The document quoted is of importance, for it shows us that the Uralic Ugrians were acquainted with the domesticated reindeer as a draught animal toward the end of the fifteenth century. In regard to the Samoyed, we can assert on the basis of this account only that reindeer were kept by them.

When Baron Sigismund von Herberstein was ambassador from the Emperor Maximilian to the Grand Prince Vasili Ivanovič of Muscovy in the years 1517 and 1526, he met at the Court of this Prince in Moscow his interpreter, Gregory Istoma, who in 1496 had been sent by the Prince to the Court of King John of Denmark, where he acquired the Latin language. He gave Herberstein an account of his journey, which had taken him over Great Novgorod to the mouths of the Dvina and Potivlo. There the party embarked in four boats, and sailed along the right-hand shore of the ocean; and after accomplishing sixteen miles and crossing a certain gulf, they sailed along the left shore. Leaving the open sea to their right, they came to the people of Finlapeia. Although these people dwell in low cottages, scattered here and there along the seacoast, and lead an almost savage life, Istoma reported, yet they are more gentle in their manners than the wild Laplanders. He stated that they were tributary to the Prince of Muscovy. A voyage of eighty miles, after leaving the land of the Laplanders, brought them to the country of Nortpoden, which was subject to the King of Sweden. The Russians call the country Kaienska Semla; and the people, Kaiemai. After having passed two perilous promontories, they sailed up to the country of the Diticiloppi, who are wild Laplanders, to a place named Dronç [Drontheim], two hundred miles north of the Dvina.

They then left their boats and performed the rest of their journey by land, in sledges. He further related that there are herds of deer there, as plentiful as oxen are with us, which are called in the Norwegian language 'rhen.' They are somewhat larger than our stags, and are used by the Laplanders instead of oxen, and in the following manner: they yoke the deer to a carriage made in the form of a fishing-boat, in which the man is bound by his feet lest he should fall out while the deer is at full speed; in his left hand he holds a bridle, to guide the

course of the deer, and in his right a staff, with which to prevent the upsetting of the carriage, if it should happen to lean too much on either side. He stated that, by this mode of travelling, he himself had accomplished twenty miles in one day, and had then let loose the deer; which returned of its own accord to its own master and its accustomed home. Having at length accomplished this journey, they came to Berges [Bergen], a city of Norway, quite in the north, amongst the mountains, and then reached Denmark on horseback.¹

As Herberstein's narrative is based on the report of Gregory Istoma, whose experience dates back to 1496, we are entitled to say that the Lapp were in the possession of sleigh-drawing reindeer in the latter part of the fifteenth century.

m Olaus Magnus, Archbishop of Upsala and Metropolitan of Sweden, who died in 1568, published in Rome, 1555, his famous work *Historia de gentium septentrionalium variis conditionibus*,² where a somewhat lengthy and fairly correct description of the reindeer of Lapland is given. Certainly he is not the first author, as asserted by Hahn, who told Europeans about the tame reindeer, as Baron von Herberstein preceded him by a generation. Olaus' account is not based on personal experience, but evidently draughted from hearsay. The English naturalist E. Topsell³ then gave a description based on Olaus, and justly emphasized that the beast was altogether unknown to the ancient Greeks and Romans.

It is thus shown that the documentary evidence presented by European history does not mention the domestic reindeer before the latter part of the fifteenth century. I regret not having access to ancient Russian chronicles, especially those of Novgorod and Archangelsk, which might contain facts bearing upon the problem. There is a noteworthy negative evidence presented by the *Kalewala*, the national epic poem of the Finn. Here we have a true picture of the primeval cultural conditions in which the Finn lived prior to their christianization (A.D. 1151), also a description of their

¹ *Notes upon Russia: being a Translation of the Earliest Account of that Country, entitled Rerum Moscoviticarum Commentarii by the Baron Sigismund von Herberstein*, translated by R. H. Major, vol. II, pp. 105-108, Hakluyt Society.

² An English translation appeared in 1658 under the title *Compendious History of the Goths, Swedes, and Vandals, and Other Northern Nations*. His description of the reindeer is on p. 176. Those who have not access to this edition may be referred to E. Phipson, *Animal-Lore of Shakespeare's Time*, p. 123, where the passage is extracted.

³ *Historie of Four-footed Beastes* (1607), p. 592.

relations to the Lapp. Sledge-driving is most frequently mentioned, but the sledges are always drawn by horses. The wild reindeer was an object of the hunt, but there is not the faintest allusion to reindeer kept in captivity under the control of man. The period of this ancient Finnish culture is difficult to gauge by exact dates, but it is generally admitted that the beginning of this national poetry falls between A.D. 800 and 1000.¹ If we assume that the Lapp adopted the domesticated reindeer from the Samoyed during the eleventh or twelfth century, we shall probably not commit too great an error of calculation.

Before leaving the European field, it should be remembered that the theory of a Scandinavian origin of reindeer domestication has also been propounded. Its main champion was a Norwegian scholar, A. Frijs.² According to him, the Lapp of the ninth century were not yet reindeer-nomads, but merely hunters and fishermen, whose only domesticated animal was the dog. The domestication of the reindeer they learned from the Scandinavians. The evidence for this bold statement is based on philological arguments: it is proved by the language of the Lapp, for only the dog has a genuine Lapp name; with the reception of the other domestic animals, the Lapp adopted also their designations; the Lapp has no word for "taming," and has therefore accepted the Scandinavian word for it. It is generally known how fallacious such play with alleged linguistic evidence is; in fact, no serious scholar any longer derives historical conclusions from conditions of language. Frijs evidently traced Lapp *raingo* ("reindeer") to Scandinavian *hreinn*, but there is as good reason to believe that the latter is based on the former. In fact, no lesser scholar than Jacob Grimm³ regards the Lapp word as the foundation of the Germanic forms (Anglo-Saxon *hrān*, Old Norse *hreinn*, Swedish *ren*, Danish *rensdyr*, German *rein*, *reiner*, *renn*). Be this as it may, neither the one nor the

¹ D. Comparetti, *Kalewala*, p. 280 (authorized translation from the Italian). It is noteworthy also that Tacitus (*Germania*, 46), in his notice of the Fenni, the oldest account of some Finno-Ugrian tribe, makes no mention whatever of deer.

² *Globus*, vol. XXII (1872), p. 2, translation of his work *En Sommer i Finmarken, Russisk Lappland og Nordkarelen* (Kristiania, 1871).

³ *Deutsches Wörterbuch*, vol. VII, col. 2007.

other supposition could prove that the domestication is due to Scandinavians, or to any other nation. It is merely indicative of a fact of language, and nothing else.

In others, the theory of the Scandinavian origin of reindeer domestication may have been inspired by certain efforts in Sweden to tame the elk (*Alces alces* or *Cervus alces*). These, however, belong to recent times, and stories relative to them are not well substantiated by historical records. Although Louis Figuier, in his *Mammalia*, asserts that in Sweden for two or three centuries the elk was used in the harness, but that the custom is now given up, the objection has justly been raised by J. D. Caton¹ that it is difficult to understand why this alleged domestication was abandoned in a country so well adapted to its use. Sporadic cases of training elks to harness may formerly have occurred in Sweden; but no general attempt to tame the animal, and certainly no "domestication" of it, has ever taken place.

As a consequence of geographical conditions, the Chinese were far removed from reindeer-breeding localities; and for this reason we cannot expect to find in their records any coherent and comprehensive accounts, which would permit us to elaborate an intelligent history of the domestication. The expansion of their political power and the extension of their influence over neighboring tribes, however, enabled the Chinese occasionally to get a glimpse of the curious animal; and for lack of any other sources, their casual mentions of it are of capital importance, and at the same time represent the oldest extant references to the reindeer.

A very curious allusion to reindeer occurs in the Annals of the Liang dynasty in the description of the mythical country Fu-sang.² In A.D. 499 the Buddhist monk Huei Shen returned to King-chou, the capital of the Liang, and gave a fabulous account of Fu-sang, alleged to have been situated far off in the northeastern ocean. As to means of conveyance, he reported, the people there have vehicles drawn by horses, oxen, and stags; they raise deer in the

¹ *The Antelope and Deer in America*, p. 278.

² *Liang shu*, ch. 54, p. 12. This work was compiled by Yao Se-lien in the first half of the seventh century from documents of the Liang dynasty, which ruled from A.D. 502 to 556.

manner as oxen are reared in China, and make cream¹ from their milk. The allusion to the reindeer is unmistakable: they are plainly described as being kept in the state of domesticity for the purpose of drawing vehicles (that is, sledges) and for milk-consumption. Such an economic condition, as described in this text—the simultaneous breeding of horse, cattle, and reindeer—is not found, however, in any region of the northern Pacific; and if Fu-sang has been identified with America by some fantasists, the fact remains that neither the domestic horse nor cattle nor reindeer ever existed in pre-Columbian America. Nor are these conditions applicable to the Island of Saghalin, which Schlegel put on a par with the Fu-sang country of the Chinese account: horse and cattle were introduced there only by the Russian settlers in the latter part of the nineteenth century; and the reindeer, as already shown by L. von Schrenck, is there likewise a recent introduction going back to a few centuries. We do not even know whether Saghalin was populated at all in the fifth century. Neither can any Tungusian tribe come into question, since the Tungus employ the reindeer only as a beast of burden and for riding-purposes, but rarely for drawing sledges. The Fu-sang account is a fantastic concoction, devoid of any geographical value, pieced together from heterogeneous elements emanating from different sources and quarters. While each of these elements bears a germ of truth, their combination makes an unreal picture. The breeding of horse, cattle, and reindeer combined, in reality, occurs only in the Baikal region, particularly among the present Soyot; and Huei Shen's account of the reindeer in connection with horse and cattle has doubtless hailed from that quarter. The ethnic and economic

¹ The Chinese term 酪 denotes any dairy products, as cream, butter, cheese, sour or fermented milk. The former translators of this text have made a liberal choice without being concerned about what products are actually made of reindeer-milk. Bretschneider had butter made from reindeer-milk, but butter is never produced from it by any East-Siberian tribe. Schlegel (*T'oung Pao*, vol. III (1892), p. 123) decided on a fermented liquor, but such is never made. In fact, reindeer-milk is not made into any product in northern Asia, but is consumed as it is, in its natural state, as a fatty, creamy substance. S. W. Williams (*Journal American Oriental Society*, vol. XI, (1882), p. 93) therefore was quite right in translating, "and make cream of their milk."

condition of this locality, which is of paramount importance for the history of reindeer domestication, will be fully discussed hereafter.

Before mentioning the three kinds of vehicles used in Fu-sang, Huei Shen speaks also of a peculiar breed of oxen with very long horns. According to Williams, the horns were so long that they would hold things—the biggest as much as five pecks. According to Schlegel, the oxen could carry on their horns loads weighing up to twenty quintals.¹ Schlegel² thinks also that the reindeer is intended by this ox, but it is improbable that Huei Shen would first designate the reindeer as an ox and in the following sentence describe it as a deer. Further, loads are never placed on the reindeer's antlers; and it is equally inconceivable that loads were ever packed on the horns of an ox.³

¹ The passage is not very clearly worded, and the text presumably is corrupted. In all probability, it means that the people used these horns for carrying loads in them, the horns holding up to twenty corns (*hu* 斛, a measure of capacity).

² *L. c.*, p. 142.

³ There are several other misconceptions in Schlegel's discussion of the subject. The Manchu term *kandahan* refers to the elk only, not to the reindeer. The Tungusian name for the "reindeer," *oron*, has no connection with Russian *olen'*, or *vice versa*, as asserted by Schlegel. Russian *olen'* is an old Indo-European word connected with Lithuanian *ėlnis*, *alnis*; Lettic *alnis*, Old Prussian *alne*, German *elen*, Greek *ἐλαφος* (from **elǵ-bhos*) and *ἐλλός* (from **elmos*, "young hart"); Armenian *elū* (doe); Cymric *elain* (doe). The Russians, according to Schlegel, do not discriminate between "stag" and "reindeer," and call both indifferently *olen'*. Russian *olen'*, however, is the general term for *cervus*, and the reindeer is properly *s'ävernī olen'* (northern deer), abbreviated into *olen'* when so understood from the context.—Neither H. C. von der Gabelentz nor Zacharov, in their Manchu dictionaries, have noted a word for the reindeer. Such, nevertheless, exists, though it is doubtless a loan-word from Tungusian. The *Ts'ing wen hui shu* (in Manchu: *Manju isabuha bilhe*, ch. 1, p. 46), a Manchu-Chinese dictionary published in 1751 by Li Yen-ki, records the well-known Tungusian term *oron* as the Manchu designation for the reindeer, giving in Chinese the definition, "name of a cervine animal, antlers growing on the heads of both male and female, subsisting on moss, and raised by the deer-hunters." The same lexicographer notes *oronggo* in the sense of "deer-hunter" (the same word signifies otherwise a wild sheep with long and flat horns, resembling the "yellow sheep," *Antilope gutturosa*; in this sense the word appears also in Mongol) and the tribal name *Orončo-i niyalma*. It is not probable that Manchu *oron* (domesticated reindeer) and *iren* (wild reindeer) are interrelated words, as proposed by W. Schott ("Ueber das altaische Sprachengeschlecht," *Abhandlungen Berliner Akademie* (1847), p. 366); for Manchu *iren* is related to the Tungusian forms *hiru* and *siru* (below the Ussuri) and *iru* (above the Ussuri), in other Tungusian dialects also *hirun*, *ira* (W. Grube, *Goldisches Wörterverzeichnis*, p. 54). Neither is there any likelihood that, as supposed by Schott, there is interrelation of Manchu *oron* and Lapp *rončo* or *ronča* (male reindeer), in which the initial vowel should have been eliminated.

The Annals of the T'ang Dynasty (618-906) contain an interesting notice of a reindeer-breeding tribe, the Wu-huan, then settled in a region east or southeast of Lake Baikal. This notice runs as follows:

The Wu-huan 烏丸 or Ku-huan 古丸, also styled Kū 鞠 or Kiai 穢, live in the northeast of the Pa-ye-ku 拔野古 (Bayirku). In their country there are trees, but grass is lacking, while there is plenty of moss. The inhabitants have neither sheep nor horses, but keep reindeer (stags) in the manner of cattle or horses. These animals subsist only on moss. They are trained to drawing sledges (carts). Reindeer-skins, moreover, are utilized as material for clothing.¹ In the *T'ang hui yao*² this text is worded as follows:

Traveling for six days in a north-easterly direction from this country (Pa-ye-ku), one arrives in the country Kū, where there are trees, but no grass. While sheep and horses are absent, there are reindeer. In like manner as cattle and horses are employed in China, the reindeer are used there for drawing sledges, which are capable of carrying three or four persons. The people clothe themselves with reindeer-skin. The reindeer subsists on the moss of the soil.

The fact that in these texts the reindeer is spoken of as a domestic animal is well attested by the use of the verb *huan* 豢 ("to feed domestic animals with grain") and by the peculiar employment of the animals in the service of man. The *T'ung tien*,³ written by Tu Yu (A.D. 735-812) between the years 766 and 801, with reference to the Wu-huan, employs straightway the term "domesticated stag" (*chia ch'u lu* 家畜鹿).

The history of the Wu-huan is well known from the Chinese Annals.⁴ In the time of their early history we hear nothing to the effect that they kept reindeer. Their domestic animals were cattle, horses, sheep, and dogs. In the beginning of the Han dynasty (about 200 B.C.) they were broken up by the Hiung-nu, who are usually regarded as identical with the Huns, and, while subject to the latter, paid their annual tribute in cattle, horses, and sheep.

¹ *T'ang shu*, ch. 217 B, pp. 7a-b.

² Ch. 98, p. 16b. This work was written by Wang P'u, and completed in A.D. 961.

³ Ch. 199, p. 18b.

⁴ See Visdelou in D'Herbelot, *Bibliothèque orientale* (La Haye, 1779), vol. iv, pp. 79-86; E. H. Parker, "History of the Wu-wan or Wu-hwan Tunguses of the First Century," *China Review*, vol. xx, pp. 71-100, and *A Thousand Years of the Tartars*, pp. 117-125.

They were pastoral nomads, roaming about with their herds wherever there was grass and water; tents, always faced toward the east, formed their habitations. Each man, from the chieftain downward, possessed his own flocks and managed his own property, nobody serving another. They were skilful horsemen and archers, given to hunting. Flesh and dairy products were their chief means of subsistence; in a small measure they also grew millet. Their garments were made from bird's down, though they understood the preparation of leather and felt. According to the Chinese system of classification, the Wu-huan were counted among the Tung Hu (Eastern Hu or Barbarians), which term has without any reason been identified with "Tungus."¹

There is no wonder that the early Wu-huan had no reindeer, for in their habitat this animal did not occur. They were first settled in southern Manchuria, and after the Chinese victories over the Hiung-nu in 120 B.C., were transplanted by the Emperor Wu into what is now the northern part of Chi-li Province and Liaotung, in order to serve as a sort of buffer-state between China and the Hiung-nu. Skilled horsemen, they were organized into cavalry squadrons. From this time onward that tribe did not play any important rôle in history. In A.D. 207 they were decisively defeated by Ts'ao Ts'ao at Liu-ch'eng. It is somewhat surprising to meet them in the T'ang period (618-906) in a new geographical environment as northeastern neighbors of the Bayirku, a branch of the Turkish Uigur, and in the entirely new economic condition

¹ This theory belongs to the category of paper etymologies. Phonetically there is not a shadow of a coincidence between Chinese Tung Hu and Tungus, except the initial consonants. The word "Tungus," about the antiquity of which nothing is known, would never have been transcribed by the Chinese in that manner. First, it is used at present only by a few clans of Tungusian tribes, and by just those who are so remote from China, that it may well be doubted that they were ever in contact with her. Secondly, the word written by us "Tungus" is pronounced by the natives claiming this name To-ńús, as noted by myself in Siberia. There is neither a *g* nor an *h* in it, and the guttural nasal opens the second syllable bearing the accent. The Chinese, accordingly, should they have had occasion to hear this name, would have transcribed it To-ńu (ngu), or To-ńu-se. The Chinese term Hu is applied to many other peoples also, especially the Iranians of Central Asia, and even to India. Klaproth (*Tableaux historiques de l'Asie*, p. 83) has already observed with correct instinct that it appears not very probable that the name "Tungus" is derived from Chinese Tung Hu.

of reindeer-breeders, as which they do not appear in any earlier period. This branch of the Wu-huan appears to have been a scattered horde, which had remained in its ancient seats, and was driven thence farther to the west, presumably as far as the country east or southeast from Lake Baikal, where the natural conditions for the maintenance of reindeer prevail. In all probability, they struck there a tribe which had already domesticated the reindeer; for Hwei Shen's report has shown us that the domestication must have been an accomplished fact in the fifth century. At any rate, there is no valid reason for crediting the Wu-huan with the initiative or with any originality in this enterprise. They were originally horsemen and cattle-breeders; and when they drifted into their new domicile, they adopted what they found, adapting themselves to this novel economy.

Marco Polo¹ speaks of a tribe called by him Mescrypt, and identified by Yule with the Merkit in the country of Bargu, near Lake Baikal:

They are a very wild race, and live by their cattle, the most of which are stags and these stags, I assure you, they used to ride upon.

Certainly this is the reindeer. Yule is inclined to think that Marco embraces under this tribal name in question characteristics belonging to tribes extending far beyond the Mekrit, and which in fact are appropriate to the Tungus; and continues that Rashid-eddīn seems to describe the latter under the name of Uriangkut of the Woods, a people dwelling beyond the frontier of Barguchin, and in connection with whom he speaks of their reindeer obscurely, as well as of their tents of birchbark, and their hunting on snowshoes. As W. Radloff² has endeavored to show, the Woodland Uryangkit, in this form mentioned by Rashid-eddīn, should be looked upon as the forefathers of the present Yakut. Rashid-eddīn, further, speaks of other Uryangkit, who are genuine Mongols, and live close together in the territory Barguchin Tukum, where the clans Khori, Bargut, and Tumat, are settled. This region is

¹ Yule and Cordier, *The Book of Ser Marco Polo*, vol. 1, p. 269.

² "Die jakutische Sprache," *Mémoires de l'Académie des Sciences de St.-Petersbourg* (1908), pp. 54-56.

X east of Lake Baikal, which receives the river Barguchin flowing out of Lake Bargu in an easterly direction. The tribal name Bargut (-t being the termination of the plural) is surely connected with the name of the said river. The Persian historian Rashid-eddin, in his history of the Mongols written in 1302, speaks of a tribe styled Woodland Uryangkit living in forests northeast of Lake Baikal.¹ Their clothing consisted of animal skins. Cattle and sheep were not reared by them, but in place of sheep and cattle they kept mountain-oxen (*gāwi kohī*), mountain-sheep (*mīš*), and *jur* (Saiga antelope). They tamed these animals, milked them, and consumed this milk. During their peregrinations they loaded the mountain-oxen, but never quitted their forests. Wherever they stopped, they made huts and yurts of birchbark. Rashid-eddin, further, narrates how they bored the birches and drank the birch-juice, and how they hunted in the winter on snowshoes, employing snow-sticks, and dragging along the spoils of the chase on sleighs. This text is very interesting,² but the Persian author's description of the domestic animals is by no means clear. Radloff infers that he alludes to a reindeer-breeding hunting-tribe, but he fails to inform us by which of the three animals named in the text he wishes to have the reindeer understood. It might not be impossible that the latter may be hidden under the mountain-ox; the Scandinavians and Lapp, for instance, apply terms like "ox," "cow," and "calf" to the reindeer.³ On the other hand, however, as the tame yak occurs in the Baikal region, and particularly among the Uryankhai, the descendants of Rashid-eddin's Uryankit,⁴

¹ In another passage of his work, Rashid-eddin states that the designation "woodland peoples" is meant in contradistinction to peoples inhabiting the steppe; but there are many kinds of forest peoples, because one or another yurt of almost every tribe is in the vicinity of a forest, and because some tribes are distant from forests a month's journey, others two months' journey, others again only a day's journey.

² It has frequently been translated: d'Ohsson, *Histoire des Mongols*, vol. 1, pp. 9, 421; F. von Erdmann, *Uebersicht der Völkerstämme nach Raschid-ud-din* (Kazan, 1841), p. 124, and *Temudschin*, p. 191; Berezin, *Istoriya Mongolov, sočinenie Rashid-eddina*, pp. 90, 141; Radloff, *l. c.*, p. 54 (revised edition of the text reprinted by Salemann, p. 84).

³ Finnish *härkä* and Lapp *herke* mean "ox," and are applied to the tame reindeer.

⁴ In the high mountainous portions of the eastern Sayan, cattle are reared in a few specimens by the Soyot up to an altitude of from five to six thousand feet, but

it may be permissible to think of the yak as well. There remain the sheep and the *jur*. The latter is a Mongol word (*dsür*) referring to the Saiga antelope. That this animal *might* be tamed and kept in captivity I do not doubt, but that it has actually been done in the region in question is not known to me. It is not plausible, either, that Rashid-eddin should avail himself, for the designation of the domestic reindeer, of a Mongol term, which strictly denotes a wild beast. Thus the word "sheep" (*mīš*) would be the last resort for the reindeer interpretation.¹ The fact that it is not an ordinary sheep becomes evident from the assertion that this people does not rear sheep. Rashid-eddin obviously speaks from hearsay, without entertaining correct notions of the matter, and his terms are evidently chosen in a state of embarrassment. If we are allowed to read from his text that he describes a reindeer-breeding people, it is less his obscure nomenclature that justifies us in this conclusion than the facts that also contemporaneous Chinese records and Marco Polo know of reindeer in this region, and that these still exist there at the present time, together with yak and horse.

There is another, ethnographical reason, which for a long time caused me to hesitate to believe in Rashid-eddin's reindeer. Radloff regards this writer's Woodland Uryangkit as the ancestors of the modern Yakut, chiefly on the ground that a former appellative of the Yakut was Urāngkhai (Urāngxai) Sakha; and he looks upon Urāngkhai as the original tribal name of the Yakut. Now, according to Radloff, the Woodland Uryangkit were a typically reindeer tribe; the Yakut, however, are not.

If, accordingly, Radloff's theory of a connection of Rashid-southward among the Uryankhai and Darkhat they are frequently replaced by *Bos grunniens* and its bastard forms with the domestic cattle, the so-called *khailuk*. The Buryat prefer the latter to *Bos grunniens*, which is known to them through the Uryankhai. Among these Soyot, as it hardly occurs otherwise in the south of eastern Siberia, the domestic ox is found, together with reindeer and horse; the reindeer, however, remains for them the most important of the three domesticated animals. G. Radde, *Reise im Süden von Ost-Sibirien*, vol. I, *Säugetier-fauna* (St. Petersburg, 1862), p. 270.

¹ In the language of the Koibal, the reindeer is styled "white goat" (*ak kīk*), according to A. Castrén, *Koibalische Sprachlehre*, p. 75.

eddīn's Uryangkit with the present Yakut be correct, we are confronted with a fundamental contrast between the cultures of the two peoples. The Uryangkit are supposed to have been active reindeer-breeders, milking the animals, and subsisting on their milk; while the Yakut do not milk them at all, and look upon the whole business as an incidental affair of their life and as a foreign invasion. This contradiction has escaped Radloff, but attention should be called to this anomaly. In their present condition, the Yakut have lived at least since the seventeenth century, when the Russians first became acquainted with them. Rashid-eddīn wrote in 1302, so that the transition, if it took place, must have been the outcome of some three centuries; but this would be difficult to accept. In all probability, we shall have to interpret the events somewhat differently. While part of the Uryangkit may have been absorbed by the Yakut, this process need not be invoked to explain the entire ethnic composition of the Yakut. It was merely one of the political events that tended to contribute to the formation of this now powerful tribe, but currents from other directions as well have had their share in its ultimate organization.

Among the Yakut, now numbering about two hundred thousand, the reindeer represents a secondary acquisition, which they received from the Tungus. This borrowing is upheld by the traditions of the Yakut themselves, who assert that the Tungus are acquainted with no other domestic beast than the reindeer, and that the latter is the truly Tungusian cattle, which for this reason they style "foreign cattle."¹ This fact is brought out by the very conditions obtaining among the Yakut in regard to the reindeer. The Yakut are not a people of nomadic habits, but lead a sedentary life, based chiefly on the maintenance of cattle and horses, on agriculture and fishery. Reindeer take only an insignificant share in their culture, and are kept but reluctantly, mainly in the northern districts of the province of Yakutsk. Reindeer-breeders, as are found among the Tungus, Chukchi, and Samoyed, do not exist in their midst. They merely keep small herds, mainly utilized for driving or as pack-animals. Solely among the Dolgan of Turukhansk, who have

¹ V. L. S'āroševski, *The Yakut* (in Russian), vol. 1, pp. 146, 307.

adopted the Tungus practice of nomadism, is the reindeer the exclusive domestic animal. The most curious fact is that the Yakut do not milk their reindeer at all, and slaughter it on rare occasions only, so that no reindeer meat is for sale among them. Their aversion toward nomadic life, and their habit of living in blockhouses, impose many restrictions on the keeping of reindeer, which without any doubt they adopted from Tungusian tribes.¹

There can be no doubt, however, that during the Mongol period (thirteenth century) the reindeer was kept in a state of domesticity in the Baikal region. We have excellent testimony to this effect in the Chinese Annals of the Mongol Dynasty.² Here mention is made of the Kirgiz on the upper Yenisei, and, in connection with them, of five smaller territories, apparently inhabited likewise by Kirgiz. One of these is styled Han-ho-na, situated at the source of the Yenisei and east of the River Wu-se (Us), an affluent of the Yenisei.

This region is accessible only over two mountain-passes and abounds in wild game, while domestic animals are scarce. The poor have no regular means of livelihood and erect hovels from birch-bark. They transport their chattels on white deer and consume the milk of this deer.

This certainly is the reindeer. It is worthy of note that in the same period we have a report from the Chinese traveler Ch'ang Te (1259) to the effect that the Kirgiz used dogs instead of horses for drawing sledges.³ Accordingly, we are here confronted with the curious fact that a people in the central and southern part of Siberia was familiar with two specific methods of transportation, which we are wont to connect with the cultures of the peoples in the high north and northeast of Asia. Klaproth⁴ thinks that the Han-ho-na were of Samoyed stock, presumably because they kept reindeer; and there is certainly a basis for this assumption. It must be considered, however, that the reindeer is not restricted to

¹ The Yakut's power of assimilation is well characterized by A. v. Middendorff (*Die Eingeborenen Sibiriens*, p. 1561), who says that among Tungusians and Samoyed the Yakut turns a Tungusian or Samoyed within the briefest space of time.

² *Yüan shi*, ch. 42; 63, p. 32 b (K'ien-lung edition).

³ E. Bretschneider, *Mediæval Researches*, vol. I, p. 129.

⁴ *Mémoires relatifs à l'Asie*, vol. I, p. 113.

certain ethnic groups, but is first of all bound to certain localities of specific floristic environment. When a tribal movement took place in the Baikal region, it could well happen that the ownership of the reindeer changed hands. The Kirgiz, taken in their entirety, were neither reindeer-breeders nor keepers of sleigh-dogs: neither the T'ang Annals, which have preserved for us the oldest account of this nation, nor Rashid-eddīn¹ or Abulgazi, state that it ever maintained herds of reindeer.

During the eighteenth century the Chinese noticed the reindeer also in the possession of Tungusian tribes like the Oroči,² but these recent references are hardly of historical interest. The news of the occurrence of domestic reindeer on Saghalin was then received in Peking as a novelty.³

Reindeer have been traced by sinologues in Chinese records where reindeer cannot be discovered by an unbiased mind. The term Ti 狄 is one of those general designations under which the ancient Chinese comprised a certain group of barbarous or semi-barbarous tribes occupying the southern part of present Mongolia. Klapproth⁴ argued that the word *ti* signifies also a large wild stag, and concluded that in ancient times the hordes in question availed themselves of reindeer, like their eastern neighbors, and that for this reason they received the name Ti.⁵ This argumentation is open to several objections: true it is, *ti* may denote a wild stag, but it is nowhere explained as a tamed deer or reindeer. There is no such interpretation, as intimated by Klapproth, of the ethnic term Ti on the part of the Chinese, neither is there any record that the alleged eastern neighbors of those Ti ever kept reindeer.

¹ His account of the Kirgiz has been translated by Klapproth, *Mémoires relatifs à l'Asie*, vol. III, p. 366.

² *Huang ts'ing chi kung t'u*, ch. 3. In the memoirs of the Manchu Tulishen's embassy to the Kalmuk (1712-15) the reindeer among the Tungus in the region of Irkutsk is briefly described. See G. T. Staunton, *Narrative of the Chinese Embassy to the Khan of the Tourgouth Tartars* (London, 1821), p. 70.

³ Compare Du Halde, *Description of the Empire of China*, vol. II, p. 247. The Japanese traveler Mamia Rinsō, who visited Saghalin in 1808, brought the first account of the reindeer to Japan. Ph. von Siebold, *Nippon*, vol. II, pp. 229-230.

⁴ *Tableaux historiques de l'Asie*, p. 102.

⁵ According to Klapproth, *Mémoires relatifs à l'Asie*, vol. I, p. 188, the term Pei Ti (Northern Ti) would date only from the T'ang period. It is found, however, at an earlier date; for instance, in the *Nan shi* (ch. 79, p. 8 a).

It is asserted also, after Chinese sources, that the northern Shi-wei should have tamed the reindeer.¹ The text here referred to, however, contains nothing to this effect, but merely says that the country of this people abounded in wild deer.² According to the Chinese account, this tribe raised cattle, swine, and dogs as domestic animals, and fish-skin formed their clothing; reindeer nomads certainly wear reindeer-skins. Another group of this people, plainly called Shi-wei, who lived a thousand *li* north of the Mo-ki or Wu-ki, the center of their territory being in the basin of Kerulen river, subsisted on pork and fish, reared cattle and horses, but lacked sheep; they clothed themselves in the skins of white deer.³ This "white deer" may have been elk or wild reindeer. Theophrastus⁴ already mentions that the skin of the wild reindeer (*tarandus*), which according to him occurs in the territories of the Scythians and Sarmatians, is of the thickness of a finger, and is so durable that it is made into thoraxes; and the lexicographer Hesychius (fifth century A.D.) says that the Scythians employed the furs of the *tarandus* as clothing.⁵

Archaeological monuments do not shed much light on the ques-

¹ J. H. Plath, *Die Mandschurey*, p. 82, who accepted the translations of the Jesuit missionaries of the eighteenth century.

² *T'ang hui yao*, ch. 96, p. 7. Compare Vasilyev in *Trudy of the Oriental Section of the Imperial Archaeological Society*, vol. IV (1859), p. 32.

³ *Wei shu*, ch. 100, p. 4 b. According to the T'ang Annals (*T'ang shu*, ch. 219, p. 7), the Shi-wei raised a large breed of swine, the tanned skin of which was used for garments. The so-called Northern Annals give the following notice of this tribe: "The Shi-wei lived a thousand *li* north of the Mu-ki, subsequently styled Mo-ho, six thousand *li* from the capital Lo-yang. In speech they were related to the Kitan. They raised cattle and horses, but not sheep, and also kept swine, subsisting on pork and fish. In the summer they led a sedentary life; in the winter they roamed along the river-courses, catching sables. They used the composite horn bows and long arrows. White-deer skins formed their clothing. Corpses were buried in the trees [as still practised by Tungusian tribes and often observed by myself]. They used coracles; and their primeval forests and pasture-lands teemed with a rich fauna, and [unfortunately, as at present] also with mosquitoes" (*Pei shi*, ch. 94, p. 9 b). Deer-skin clothing is ascribed by the Chinese annalists to several other tribes of Siberia; thus, for instance, the women of the Liu-kuei, a tribe to be located in Kamchatka (see *T'oung Pao*, 1916, p. 368), employed for their winter costume skins of swine and stag, and fish-skins for summer-dress.

⁴ *Fragments*, 172 (*opera*, ed. Wimmer, p. 458).

⁵ Sarauw, *Rentier in Europa*, p. 10.

tion. Wild deer, particularly the elk, are frequently represented on so-called Scythian and Siberian antiquities of the bronze age.¹ In Mongolia many sepulchral stones with figures of stags have been found.² A representation of domestic reindeer accompanied by men, of ancient date, has not yet been traced.

From the preceding notes it becomes manifest that the domestication of the reindeer does not go back to times of a dim antiquity, but is of a comparatively recent date, falling within the historical era. The Chinese account of A.D. 499, as far as we know at present, is the earliest in existence. The reindeer was then milked and employed as a draught-animal; in other words, its domestication was then an accomplished fact. By calculating several centuries upward of that date, we thus arrive at the primeval period when the initial steps leading to the domestication were taken. The interval required for the process of domestication in its various stages will naturally remain a matter of conjecture and speculation, but a fair compromise may be reached by the formula that the incipient stage may belong to the beginnings of our era. It is obvious also, from a purely historical standpoint, that the domestication is far older in Asia than in Europe, and that consequently the center from which the domestication has taken its starting-point must be sought for on Asiatic soil.

CENTER OF DOMESTICATION

All observers agree in regarding the domestication of the reindeer as an imitative process leaning toward that of horse and cattle. In fact, the reindeer is utilized by man in exactly the same manner as those two breeds,—as a draught, pack, and riding animal. The recent date of the domestication also brings out its secondary character. One of the most peculiar and uniform features which is apt to illustrate the imitative tendency is the castration of the stags, practised alike throughout the zone of reindeer occurrence.

¹ See Aspelin, *Antiquités du nord finno-ougrien*, p. 68, no. 307; p. 69, nos. 311, 313-315; p. 71, no. 323.

² *Inscriptions de l'Énisseti*, p. 16. I. G. Granö, *Archäol. Beobachtungen in Südsibirien und Nordwest-Mongolei* (Helsingfors, 1910), pp. 49, 53; and *Geogr. Verbreitung der Altertümer in der Nordwest-Mongolei* (*ibid.*, 1910), pp. 37, 45.

In the eighteenth century Knud Leems¹ reported, "Taurum rangiferinum castraturus Lappo, testiculos non, ut alias fieri solet, dissecta cute, eruit, sed, admoto ore, dentibus contundit." In the same manner the process is described in modern times by J. D. Caton,²

The Lapp perform the operation with their teeth; the glands are bruised or crushed without breaking the skin. No other mode of castration has ever been known among the Lapp. This imperfect operation is probably sufficient for their purposes, for it so subdues the natural ferocity of the animal as to subject him to control, while it leaves enough of spirit to make his services highly sufficient. Were it carried as far as with us, it might so destroy his energy as to leave him practically useless.³

The Ostyak designate the gelded reindeer *xatri*, which, according to S. Patkanov,⁴ is a loan-word received from Samoyed. Whether the Ostyak adopted the process from this people remains an open question; but this is more than probable, in view of the fact that the Samoyed are the most skilful and successful reindeer-breeders, and are doubtless responsible for the transportation of the animal from Asia to Europe.⁵ The Chukchi, according to Bogoras,⁶ in order to geld the bucks, bite with their teeth either through the dowcets or through the spermatic ducts. The operation is said

¹ *Beskrivelse over Finmarkens Lapper* (Kjöbenhavn, 1767; in Danish and Latin), p. 152. About a century earlier we have the same observation recorded by J. Scheffer, *Lappland* (Frankfurt, 1675), p. 374.

² *A Summer in Norway* (Chicago, 1880), p. 228.

³ See also E. Demant, *Das Buch des Lappen Johan Turi*, p. 40. This book contains the autobiography of a Lapp, and is one of the finest documents of primitive life and thought that we possess.

⁴ *Die Irtysch-Ostjaken*, vol. I, p. 18. See also A. Ahlqvist, *Journal de la Société finno-ougrienne*, vol. VIII, 1890, p. 6. There are many more Samoyed loan-words in Ostyak relative to reindeer-culture: hence Ahlqvist (*ibid.*, p. 21) concluded that the Ostyak appear to have adopted from the Samoyed certain important features of reindeer-breeding, or perhaps even this entire industry.

⁵ Among the Samoyed, a very specialized nomenclature of the reindeer and the equipment relating to it obtains, as shown by a glance at A. Castrén's *Wörterverzeichnis aus den samojedischen Sprachen*, pp. 262-263. Terms denoting the wild and domesticated animal, the gelded and ungelded male, are strictly differentiated; and there are peculiar words for the female, the calf in its various stages of growth, the old and the hornless animal, with many variations in the dialects.

⁶ *Jesup North Pacific Expedition*, vol. VII, p. 84.

not to affect the reindeer much, for immediately afterward it continues to graze. Sometimes the scrotum is tied very tightly with a sinew thread, and after a while becomes atrophied and drops off.

The milking of the reindeer is another practice which demonstrates the dependence of the domestication. There can be no doubt that it came into existence in imitation of milking cows, mares, and sheep. The fact that this economy is comparatively old is attested by the Chinese account of the fifth century. Even the Tungus, who, with a few exceptions, use the reindeer solely for riding, milk the calving females. Four teacupfuls of milk within twenty-four hours make the whole produce. The Chukchi even try to suck milk from the doe's udder.¹ The reindeer is plainly not a milk-furnishing animal, and has been forced by man into assuming a rôle which is denied to it by nature.²

Property-marks for the purpose of recognizing their animals are utilized by all reindeer-breeding tribes. The Chukchi again betray their fondness of biting likewise in this case; for they mark their property by biting a piece out of the fawns' ears in late summer, or the next spring during the separation of bucks from pregnant dams. The Lapp,³ Samoyed, Tungus, and other reindeer peoples, cut marks in the ears of their animals. Thirteen such marks from the Tungus of Ayan have been illustrated by Pekarski and Tsv'ätkov.⁴ One or two cuts, in straight lines, angular, or rounded, are made in one ear or in both. This practice has been perpetuated by our Government in Alaska.

Every local superintendent must take careful oversight of the annual marking of the reindeer and see that all reindeer are correctly marked according to ownership. He shall keep a complete list of such marks in the records of the station.⁵

¹ Bogoras, *l. c.*

² In regard to peculiar methods of milking on the part of the Lapp, see E. Demant, *Buch des Lappen Johan Turi*, pp. 30, 39; on the part of the Soyot Ø. Olsen, *Et primitivt folk* (Kristiania, 1914), p. 67.

³ J. Scheffer, *Lappland*, p. 379.

⁴ "Očerki byta Priayanskix Tungusov," *Publication du Musée d'Anthropologie*, vol. II, p. 37.

⁵ *Rules and Regulations regarding the U. S. Reindeer Service in Alaska*, approved June 10, 1907, and December 7, 1908 (Washington, 1911).

Aluminum button markers are employed for this purpose.¹ The reindeer-breeders of Siberia are not the originators of this custom, but it was doubtless transmitted to them by Turkish-Mongol tribes. The term *tamaga*, *tamga*, *tamka*, denoting a property-mark on cattle and subsequently a seal, is common to all of these; it is diffused all over Siberia, and is even known in China and Tibet (*dam-k'a*, *t'am-ga*).²

The uniformity of reindeer-breeding is characterized also by the universal method of lassoing the animals. Everywhere a long lasso, either plaited from horse-hair or from thin seal-skin straps, is used for catching the deer after pasturing in the morning, when its services are required. The Tungus are very skilful in throwing the lasso from a respectable distance; and most animals will patiently halt, or even run to their master's side, as soon as merely touched by the rope. A classical description of this procedure is given by the Yakut Uvarovski in his autobiography.³

The reindeer-breeders cannot lay claim, either, to any original thought or invention as to the entire apparatus utilized by them in connection with the reindeer. Above all, the pack-saddle and the method of loading, riding-saddle, harness, sledge, and snowshoes, are all borrowed institutions.⁴ The geographical distribution of sledge and snowshoe by no means coincides with the area of reindeer domestication. On the one hand, we encounter the two implements among the primitive dog-breeding tribes of northern and northeastern Asia, inclusive of the Amur and Ussuri regions, where the reindeer is unknown; and, on the other hand, they extend far into the south of Siberia, even into Mongolia and Turkistan, where they are associated neither with the dog nor with the reindeer. Sledge and snowshoe, accordingly, cover an infinitely wider territory than the domestic reindeer, and obviously were in existence in

¹ S. Jackson, *Fourteenth Annual Report on Introduction of Reindeer into Alaska, 1904* (Washington, 1905), p. 108. On plates 33 and 34 of this report will be found illustrations of several such marks.

² W. Radloff, *Wörterbuch der Türk-Dialecte*, vol. III, col. 1003; T. Watters, *Essays on the Chinese Language*, p. 374.

³ O. Böttlingk, *Ueber die Sprache der Jakuten*, text, p. 45.

⁴ Bogoras (*l. c.*, p. 88) has called attention to the uniform character of the collar for the sledge-reindeer among Chukchi, Tungus, Samoyed, and Lapp.

times prior to its domestication. As we learn from the early Chinese account relating to the year A.D. 499, the reindeer must have been trained to the sledge at that date (and certain it is that this utilization of the animal preceded its breaking-in for the saddle); and, since the same people had also horses and oxen for drawing vehicles, it is manifest that this older method was simply transferred to the reindeer. The Chinese annals furnish several classical examples of the early employment of snowshoe and sledge on the part of tribes which never availed themselves of the service of the reindeer.

According to the Annals of the T'ang dynasty (618-906), there was east of the Kirgiz, on the Yenisei, a tribe styled "Snowshoe Turks" (Mu ma T'u-küe, literally, "wooden-horse T'u-küe"),¹ consisting of three hordes.

They covered their habitations with birch-bark and owned numerous horses. They used to cross the ice on snowshoes ('wooden horses') which they tied to their feet, taking curved branches as supports for the shoulders (snow-sticks), and thus swiftly pushing ahead.

In regard to the Pa-ye-ku (Bayirku), it is said that all people put wooden boards under their feet and pursue deer over the ice.² The Liu-kuei, a tribe to be located in Kamchatka and mentioned on page 113, note 3, according to the T'ang Annals,³ "fastened to their feet wooden boards six inches wide and seven feet long, and thus hunted the game over the ice." Likewise the Kirgiz on the upper Yenisei, of whom we have a description in the Annals of the T'ang, pursued the game on snowshoes.⁴ A description of the snowshoe and the mode of using it is given also by Rashid-eddin in connection

¹ In Tibetan, *šin-rla* (wooden horse) means any vehicle or carriage. Compare also Russian *konki* (skates; literally, little horses), from *kon'ok*, diminutive of *kon'* (horse). Chinese T'u-küe represents a transcription of the name Türk, more exactly of the plural form Türküt (see Pelliot, *T'oung Pao*, 1915, p. 687).

² *T'ang hui yao*, ch. 98, p. 16. The Pa-ye-ku are mentioned under the name Bayirku in the Turkish inscriptions of Kül-tegin and Bilgä-kagan; they were a Turkish tribe living in the north of the Gobi. See also above, p. 105.

³ Ch. 220, p. 11 b.

⁴ Some authors, like Klaproth and Ritter, thought in this connection of sledges; but it has been correctly observed by W. Schott, in "Ueber die ächten Kirgisen," *Abhandlungen Berliner Akademie* (1865), p. 447; and his additional notes in *Monatsberichte Berliner Akademie* (1874), pp. 1-8, that snowshoes solely are involved.

with the Uryangkit (above, p. 108). He adds that the snowshoe is known in a large part of Mongolia and Turkistan, and that ski-running is particularly practised by the Barguchim Tukum, Khori, Kirgiz, Urasut, Telengut, and Tumat. The word used by the Persian annalist is *čane* or *čana*, which, as is well known, is found in all Turkish and Mongol languages with both significances, "snowshoe" and "sledge:" Mongol *tsana* and *čana*, Buryat *sana*, Altaic *čanak*, *čana*, etc.; Finnish *saani*, Esthonian *sāñ*, Lettish *sāñus*, *sañas*, Magyar *szán*, *szány*, or *szánka*, *szánko* (diminutive); Russian *sani* (plural), *sanki* or *sanočki* (diminutive).¹

A profound study of all types of sledge and snowshoe will doubtless yield promising results.² Here it may be emphasized only that the reindeer-breeders adopted ready-made what they found, merely changing some of the material: thus they preferred reindeer-skin for snowshoes, while the Turks used horse-skin and the Gilyak seal-skin. L. von Schrenck³ has shown in particular how the Oročon (Schrenck: Oroki), scattered over a few spots of Saghalin Island, adapted the dog-sledge of the Gilyak to reindeer-transportation.⁴

From a negative viewpoint, we might say that neither the

¹ J. Kalima (*Wörter und Sachen* (1910), vol. II, p. 183) has studied to some extent the distribution of this word from the Slavistic standpoint, and arrives at the conclusion that it is a very ancient word, which Slavic, Finno-Ugrian, and Turkish languages have in common. In my opinion, the word is of Turkish-Mongol origin, and a loan-word in Finno-Ugrian and Slavic. There can be no doubt that the term has migrated jointly with the object which it denotes. The investigation of Kalima is obscured by the fact that he adds Lapp *čivinne*, Russian *čuni*, *čunki* (in the northern dialects), and Vogul *šun*, which must be dissociated from the above series, and in fact are independent words.

² Compare the preliminary remarks on snowshoes by G. Hatt, "Moccasins and Their Relation to Arctic Footwear," *Memoirs American Anthropological Association*, vol. III, 1916, p. 240.

³ *Reisen und Forschungen im Amur-Lande*, vol. III, p. 494.

⁴ It is not correct, however, to say with Schrenck that the Saghalin Oročon are the only Tungusians to make use of sledges in connection with the reindeer. The practice is not generally Tungusian, as wrongly asserted by C. Hiekisch, *Die Tungusen*, p. 78, but is an exception, which, however, occurs sporadically wherever Tungusians come in contact with Palaeo-Asiatic dog-breeders. The illustration of a Tundra Tungus in the Kolyma district, driving on a reindeer-sledge, may be seen in V. Jochelson, *Očerok z'üropromyšlennosti i torgovli m'äxami v Kolymskom okrug'ä* (Sketch of the Animal Industry and Fur Trade in the District of Kolyma), p. 36.

Lapp nor the Ugrians in the west, nor the Yakut (p. 110), nor the Chukchi and Koryak in the northeast, can come into question as the original reindeer-tamers. Among the Chukchi the introduction of the reindeer appears to be an affair of comparatively recent date, as shown, if by nought else, by the imperfect degree of domestication. It is difficult, however, to accept Bogoras' opinion that "they did not introduce the tame reindeer from their neighbors, but that, in imitation of them, they attempted to domesticate the race of reindeer inhabiting their own country." Such an expenditure of energy cannot be attributed to the Chukchi; and, as a matter of fact, such an instance of waste of energy is beyond our experience in the life of peoples. Man in general is not inclined toward work, unless compelled by sheer necessity or some inducement; still less does he try to do over again what has been accomplished by his neighbor. Bogoras believes his theory to be plausible, since the Chukchi reindeer is quite different from that of the Tungus. This fact, however, can be simply explained from the constant crossings between tame and wild reindeer, emphasized by Bogoras farther on. It is inconceivable that any Palaeo-Asiatic tribe ever undertook to domesticate the reindeer, as the maintenance of sleigh-dogs excludes the reindeer. L. von Schrenck¹ has already made the appropriate remark that

the ancestors of the migrating Chukchi and Koryak themselves surely did not domesticate the reindeer, but received it in the domesticated state from a nomadic tribe, presumably the Tungus.

Tungusians, however, cannot be claimed to be the originators of reindeer-domestication, as L. von Schrenck maintains they are. The first Russian discoverers of eastern Siberia, who came in contact with the Tungus, speak of Reindeer, Horse, Dog, Steppe, and Woodland Tungus.² These divisions have no ethnographical sig-

¹ *Reisen und Forschungen im Amur-Lande*, vol. III, p. 489.

² P. J. v. Strahlenberg, *Das nord- und östliche Theil von Europa und Asia* (Stockholm, 1730), p. 423. Regarding the distribution and economy of the Tungus, see S. Patkanow, "Geographie und Statistik der Tungusen-Stämme Sibiriens" *Keleti Szemle*, vol. IV, pp. 141-171, 287-316; vol. V, pp. 36-56, 185-203; vol. VI, pp. 130-174, 222-283; and the same author's *O prirost'ü inorodčeskago naseleniya Sibiri* (S.-Peterburg, 1911), pp. 87-115.

nificance, but merely allude to the economic conditions under which the people were encountered at a certain time. Even this mode of life is by no means a stable characteristic, for the economy of these tribes is subject to sudden and fundamental changes. Cases have occurred where reindeer-owners lost their herds and turned to the rearing of horses or only dogs, or where woodland people were transformed into inhabitants of the steppe.¹ The Birar, settled in the river system of the Bureya and on both banks of the Amur above and below the mouth of that side-river, according to the Cossack Poyarkov, who came in touch with them in 1646, were engaged in reindeer-breeding; only thirty-five years later they are described as horse-nomads.² The Tungusians, accordingly, are shifting opportunists, and, in the course of their constant peregrinations, simply adopt that mode of life best suited to the geographical and economic environment of the respective places. Originally they were mere hunters and fishermen; but, being possessed of an adaptable spirit and a quick grasp of changeable conditions, they were capable of appropriating any industry offered by their neighbors. Historical considerations show us that the Tungusian tribes, in former periods of their life, were never given to reindeer-breeding. In fact, they are late arrivals in Siberia, while their original home is to be sought for in Manchuria. We can trace their history almost completely from very early times by means of the Chinese annals; but in these no mention of reindeer is made with reference to any Tungusian people, with the sole exception of a branch of the Wu-huan (p. 105). Only when they were pushed into Siberian regions did they become acquainted with the reindeer. It is even doubtful whether the Tungusians were the first to use the reindeer as a riding-beast. The Soyot, as will be seen, still ride the reindeer; and the reindeer-riding tribe alluded to by Marco Polo (p. 107) was doubtless related to the Soyot or their group.

If it is true that the reindeer represents a mere repetition of cattle and horse domestication on a smaller scale, it is logical to

¹ Examples are cited by C. Hiekisch, *Die Tungusen*, p. 47; and L. v. Schrenck, *Reisen und Forschungen im Amur-Lande*, vol. III, p. 144.

² Patkanow, *Keleti Szemle* (1904), vol. V, p. 41.

conclude that the reindeer can have been domesticated only in a locality where it occurred in close association with cattle and horse. In the northern regions, where the wild tundra reindeer prevails, we meet at present as domestic animals the reindeer and the dog; in the southern belt, occupied by the wild woodland reindeer, we find the domestic reindeer in company with other large domestic stocks. It is therefore clear that the original center of domestication is to be looked for in the southern belt. The fact that Ugrian peoples were in possession of reindeer-herds employed as draught-animals toward the end of the fifteenth century, has been established from Russian documents (pp. 96-99). At present the well-to-do Wogul living in Beresov (in the western part of Tobolsk government) keep cows, horses, and reindeer. They are so reduced to poverty, however, that few own more than several tens. A Wogul on the upper Tapsya River, who has a couple of hundred, is regarded as very rich in this region; whereas, compared with well-to-do Samoyed in Obdorsk, he would only be a wretched beggar, for these count their reindeer by the thousands.¹ In the beginning of the eighteenth century the wealthy among the Ugrian Ostyak still kept a large number of reindeer, together with cattle, horses, and dogs; but many of them were so poor that they had to be content with reindeer. This is the account of G. Novitski, who wrote in 1715,—the earliest historian of this tribe.² At the present time, only the Ostyak of the north, being neighbors of the Samoyed, still have reindeer;³ but it lost ground among the Irtysh-Ostyak farther south. In the epic traditions of this people, ably collected and translated by S. Patkanov and traced with good reason to a period from the fourteenth to the fifteenth century, reindeer and

¹ A. Ahlquist, in *Erman's Archiv für wissenschaft. Kunde von Russland* (1860), vol. xx, p. 157. Regarding reindeer among the Wogul, see also A. Erman, *Reise um die Welt*, vol. I, pt. 1, p. 384. Reindeer-sledges of the Wogul are illustrated by K. D. Nosilov, *U Vogulov očerki i nabroski* (1904), pp. 183, 189.

² G. Novitski, *Kratkoe opisanie o narod'ü Ost'atskom*, ed. of L. Maikov (St. Petersburg, 1884), p. 37. An interesting contribution to the history of this people is the article of A. van Gennep, "Origine et fortune du nom de peuple 'ostiak'" *Keleti Szemle* (1902), vol. III, pp. 13-32; reprinted in his *Religions, mœurs et légendes*, pp. 94-109.

³ M. A. Castrén, *Reiseerinnerungen aus den Jahren 1838-1844*, p. 300.

dog are mentioned as domestic animals. At that time, also the inhabitants of the northern part of the district of Tobolsk kept herds of reindeer; while at present half-domesticated reindeer are encountered only farther northward, beneath Beresov. The domestic reindeer supplied the Ostyak with meat, skins, and sinews; served as most important draught-animal in those snow-abounding regions; and was slaughtered in honor of the gods on the occasion of the sacrificial holidays. When the breeding of reindeer was still thriving among them, this animal was exclusively chosen for the sacrifice, which is still customary in the north, among the Ostyak and Samoyed living there.¹ Patkanov holds the opinion that reindeer-breeding is only a secondary industry among the Ostyak and Wogul; that is to say, when these tribes were pushed from southern regions into their present northern domicile, they were compelled to abandon the larger domestic breeds in consequence of unfavorable geographical conditions, and to take to the reindeer. I would not subscribe to this theory unconditionally; but what interests us in this connection is merely the coexistence of reindeer, cattle, and horse among Wogul and Ostyak, neither of whom, notwithstanding, can be regarded as the original domesticator of the reindeer.

There is but one territory where all the necessary postulates for reindeer-breeding are given, and which may come into question as the original center of the domestication, and this is the region of Lake Baikal. There we meet the reindeer, wild and domesticated, and, as has been shown, from ancient times. There we meet a host of tribes partially engaged in horse and cattle rearing, and partially depending on the reindeer; there, accordingly, the contact of reindeer-breeders with horse and cattle raisers is virtually established. The ancient Chinese records, as we have seen, likewise point to the same center. In the Baikal territory we find at the present time three large and distinct stocks of peoples,—the Buryat, a branch of the Mongol family; Tungusians; and a large number of tribes, originally of Samoyed and Yenisei-Ostyak stock, but now either Turkicized (*otatarilis*, "Tatarized," as the Russians say)

¹ S. Patkanov, *Die Irtysh-Ostjaken*, vol. I, p. 109; vol. II, p. 017.

or Mongolized, and for the most part speaking a Turkish language. The Buryat occupy the area in the governments of Irkutsk and Transbaikalia from the Chinese frontier as far as the Lena system northward, and from the rivers Onon to Oka, the side-river of the Angara, westward, and still farther west into the region of Nižne-Udinsk. The Buryat element is strongest beyond the Baikal, in the valleys of the Uda, Onon, and Selenga. Those on this side of the Baikal are to some extent Russianized, even practising agriculture. The others are herdsmen and owners of horses, cattle, sheep, and goats. The reindeer is entirely foreign to them, and never was in the hands of any tribe of the Mongol family. Tungusians are scattered in the governments of Irkutsk, Yenisei, and Transbaikalia, chiefly subsisting on fishing and hunting, but also on agriculture and cattle-breeding. In Irkutsk government only a few clans on the upper Lena keep reindeer; in Yenisei government the latter are owned only by the well-to-do. In Transbaikalia we encounter among the Tungusians hunters, agriculturists, cattle-breeders, and reindeer people. Especially those inhabiting the districts of Tshitin and Barguzin keep reindeer.¹

It seems certain that the Samoyed are not autochthonous in their present habitats, but migrated there from southern regions, in all probability from the territory of the Sayan mountains or the upper courses of the Yenisei basin, where there are still many scattered tribes of them enclosed by Mongols and Turks. Most of these split Samoyed adopted the language and customs of their superior neighbors, yet they remain conscious of the fact of their original nationality. I designate this group as Sayan tribes or southern Samoyed. Among the Soyot within the boundaries of China there are family-names that also occur among the Samoyed roving along the Arctic littorals.² The Woodland Kamasin still spoke Samoyed at the time of Castrén's travels (about 1840-50);

¹ S. Patkanov, *Keleti Szemle*, vol. vi (1905), pp. 278, 279. Concerning the Barguzin Tungus, see an article by N. M. Dobromyslov, "Zam'atki po etnografii Barguzinskix Oročen," in *Trudy* of the Troitskosavsk-Kiachta Section of the Imperial Geogr. Soc., vol. v (1902), pp. 78-87.

² M. A. Castrén, *Kleinere Schriften*, pp. 116-117; W. Crahmer, *Zeitschrift für Ethnologie* (1912), p. 110.

but fifteen years later, when visited by W. Radloff,¹ they had adopted a Turkish form of speech. Two groups of these peoples are still active reindeer-breeders,—the Karagas and the Soyot. The former roam in the territory between the rivers Oka, Uda, Biryusa, and Kan (the boundary district of the governments of Yenisei and Irkutsk), numbering about 550 individuals. They are divided into five clans, one living in the neighborhood of the Soyot, another near the Kamasin, and another near the Buryat. Although now speaking a Turkish language of which we have an excellent grammar by Castrén, and closely resembling their Turkish neighbors in costume and manners, their methods of hunting and reindeer-keeping, as well as their winter tents made of reindeer-skins, are identical with those of the Samoyed. Also their physical habitus, several of their family names, and the survival of many Samoyed words in their speech, clearly bespeak their origin. The Soyot or Soyon, styling themselves Tuba and designated by the Mongols Urangkhai (see above, p. 109), inhabit northwestern Mongolia and a small strip of country along the Russian frontier from the sources of the river Kobdo as far as lake Koso. A great number of them who live farther south on the slopes of the Tangnu mountains are completely converted into Mongols. According to Castrén, many Soyot clan-names agree with those of the Samoyed; and the Soyot clan Mattar, according to traditions, originated from the Mator, who decidedly were Samoyed; he argued also that several Yenisei-Ostyak clans had become Soyot. Radloff² regards them as a medley of Kirgiz, Samoyed, and Yenisei-Ostyak; Katanov,³ as consisting of Mongol, Turkish, and Samoyed elements. At present their language is Turkish, but among many tribes Buddhism and Mongol speech have spread so widely, that the Turkish element is threatened with extinction.

G. Radde,⁴ in 1862, outlined the following sketch of the distri-

¹ *Ethnographische Uebersicht der Türkstämme*, p. 6. Regarding the Sayan tribes compare also the interesting article of N. F. Katanov, "Predaniya Prisyanskix plemen o prežnix d'älax i l'ud'ax," in *Sbornik v čest' semides'atil'ätiya G. N. Potanina*, pp. 265-288.

² *L. c.*, p. 17.

³ In *Sbornik Potanina*, p. 286.

⁴ *Reisen im Süden von Ost-Sibirien*, vol. I, *Säugetierfauna*, p. 287.

bution of the reindeer in the Baikal region. South of Ilchir lake the tame reindeer, together with the horse and frequently also with cattle, is found among the mountain tribes. During the summer a division of these herds becomes necessary, the reindeer being driven into the high mountains of an altitude of seven or eight thousand feet, the horses and cattle grazing in the deeper valleys of four or five thousand feet. In the Baikal regions the reindeer is ubiquitous; in the southwestern parts, however, it is sparse now. In the mountains where the river Jida takes its source, south of Turansk, it is met among the Uryankhai, who inhabit there the space between the Russian and Chinese frontiers. It is excluded from the Selenga valley, the upper part of which, on the Russian side, is inhabited by Buryat engaged in the rearing of sheep, cattle, and horses. In the northeastern corner of lake Baikal it increases in frequency, but even there the Tungusians become impoverished in consequence of the decrease of the stock. In regard to the Soyot and Jot, he observes that they rear reindeer in large numbers (up to three hundred). The wild species still occurs farther to the south as an inhabitant of the upper zones of the forest boundary, and beyond as far as the snow-line. Hahn¹ has made the correct observation that in the Sayan mountains, the source of the Amur, the reindeer reaches the southernmost point of its diffusion, and comes there in contact with the camel and tame yak; but he draws from this fact no conclusion whatever as to the home of the domestication, but offers solely the commonplace remark that any of the migratory tribes of northeastern Asia may have been pushed back into an inhospitable country, and, losing its stock of cattle and pack-animals owing to the unfavorable climate, tamed the reindeer as a substitute.

The Soyot were visited and studied in the summer of 1914 by Ørjan Olsen, who published interesting information on the tribe.² According to this author, the breeding of reindeer constitutes a secondary industry among the Soyot, who also keep horses and dogs, in opposition to the Lapp and Samoyed. Their herds are

¹ *Hausliere*, p. 266.

² *Et primitivt folk. De mongolske Rennomader* (Kristiania, 1915). Compare the analysis of Ch. Rabot in *La Géographie*, vol. XXXI (1916-17), pp. 42-46.

not very numerous. The most fortunate among the inhabitants of the Sayan mountains (and there are few) own no more than four hundred animals; in general, the herds count from ten to fifteen heads, at least on the banks of the Sesti-Kem. The people, accordingly, cannot live exclusively on the flesh of their herds; and those on the upper Yenisei loathe to slaughter their animals, unless compelled to do so by famine. The only alimentary product is the milk, consumed either fresh or in the shape of butter or cheese. One or two large cupfuls are obtained from each operation, which is performed twice a day in an enclosure formed by wooden palisades. The reindeer is used by the Soyot as a pack and riding animal.¹ It is not attached to a sledge. The animal belongs to a very sturdy breed, the largest being able to carry loads from eighty to one hundred and ten kilo; with such a load, they make five to six kilometers an hour.

Among the Soyot, the domestication of the reindeer has progressed further than among any North-Asiatic tribe. Although they capture wild reindeer and cross these with their domesticated individuals, this offspring is remarkably little savage. Whereas other reindeer must be lassoed in order to be caught for duty, the Soyot reindeer allow themselves to be caught by hand, and follow their master like dogs, licking his hand with the expectation of a bit of salt. When pasturing in the woodland, a call from their owner is sufficient to make them return immediately. It is a notable feature also that the domestic reindeer of the Soyot territory is capable of standing the extreme summer heat. At that time the wild reindeer, which likewise occurs in the region of the sources of the Yenisei, take refuge in the snow zone of the high mountains. The domesticated herds constantly remain in the forest, in the proximity of human habitations, without suffering

¹ Compare the illustrations in Olsen, pp. 52, 73. According to I. Pesterev *Magasin asiatique*, by J. Klaproth (Paris, 1825), vol. I, p. 126, who was commanded to the Russian-Chinese frontier in the districts Udinsk and Abakansk from 1772 to 1781, the nomadic tribes near the fort of Udinsk (then belonging to the government of Tobolsk), divided into four sections, Silpigursk, Udinsk, Karagansk, and Kamgatsk, kept domestic reindeer from oldest times, the richest possessing a hundred animals; seven years before his time they lost the greatest part. He states also that the stags were used for the hunt and mounted by the hunters.

from the heat. During the hot hours they rest under thickly foliated trees. In order to protect the fawns from the blaze of the sun, the Soyot erect hedges around large cedars.

The culture of the Soyot, like that of any other people in northern and central Asia, is in a state of complete disintegration, and original conditions can no longer be expected. What we find at present is merely the weak echo of a former glory which still eloquently speaks to us from the brief accounts of Marco Polo, Rashid-eddin, and the Chinese annals. It is difficult, if not impossible, to credit any domestication to a certain people, or even to a certain stock of peoples. In the majority of cases we must be content to trace the beginnings of a domestication to a more or less securely defined geographical area. In the present case it can be positively stated only that the primeval domestication of the reindeer took place in the Baikal region; but, if the original domestication of the reindeer is to be attached to the name of a tribal group, I should venture to say it was the southern Samoyed, or the Samoyed in the early period of their history, before migrating into their present northern habitats. I do not say, of course, that the present Soyot were the domesticators: our knowledge of the history of this tribe is altogether too vague to admit of such an interpretation. The Soyot are simply remnants and epigones of that once extended and powerful family in the midst of which this fact was accomplished.

The history of the domestication can now be clearly conceived. From the Samoyed it spread eastward to the Tungusians; from the latter to the Yakut, Chukchi, and Koryak; westward to the Ugrian tribes of the Ural and the Lapp.¹ Applied to the reindeer, this result means that the woodland reindeer was domesticated in times prior to the tundra reindeer. When the Samoyed moved northward, they naturally took along their woodland reindeer, and gradually replenished and improved their old stock by capturing wild tundra reindeer (by the methods described in the following

¹ The peculiar boat-shaped sledges of the Lapp, to which G. Hatt, "Lappiske slædeformer," *Geografisk Tidsskrift*, vol. xxii (1913), pp. 139-145, has devoted a special study, in my opinion are derived from the Samoyed; for A. Olearius, *Reise-Beschreibungen* (Hamburg, 1696), p. 81, already mentions the reindeer-sledges of the Samoyed, which are shaped like half canoes or boats.

chapter), until a point was reached when the latter breed preponderated or prevailed exclusively.

The Ainu of Saghalin do not keep reindeer, but only know the animal (styled by them *tonakai*) in the possession of the Tungusian Oročon. It would hardly be necessary to emphasize this fact, were it not that A. E. von Nordenskiöld¹ has published the sketch of an Ainu standing on large snowshoes, and pulled along by a reindeer the bridle of which is tied to his belt. This illustration is said to be derived from a Japanese book published in 1804. In regard to such an employment of the reindeer on the part of the Ainu I learned nothing on Saghalin, nor can I find any reference to it in the literature on the Ainu. Even the Japanese traveler Mamia Rinsō, who visited Saghalin in 1808, and whose valuable account has been made accessible by Ph. von Siebold, gives no information on this point; on the contrary, he mentions the reindeer only in the possession of the Orotsuko (Orokko, Oroki, Oročon).² The sketch in question, accordingly, is either based on an incidental and isolated occurrence, or, which is more probable, represents a purely imaginative artistic production in which two features foreign to the Japanese—snowshoes and reindeer—were arbitrarily combined.

PROCESS OF DOMESTICATION

We have no contemporaneous records showing how the initial domestication of the reindeer was brought into effect. In order to obtain some idea as to how this was done, or might have been done, we must rely upon a reconstructive method. One means to this end is furnished by present-day observations of the training of individual animals. The schooling of the individual is typical of the entire breed, and the course of lessons through which each animal has to run at present must have been valid, with some variations perhaps, also ages ago.

In regard to the training of the animals, S. Jackson³ has the following observation:

¹ *Umseglung Asiens und Europas auf der Vega*, vol. II, p. 101.

² Ph. von Siebold, *Nippon*, new ed., vol. II, p. 229.

³ *Fourteenth Annual Report on Introduction of Domestic Reindeer into Alaska* (Washington, 1905), p. 126.

Here

The training begins when the deer is three years old. Generally the stoutest males and geldings are selected. Females are also trained, but they are smaller and less enduring. The training begins by lassoing the selected animals, thus separating them from the herd. The poor beasts are much scared, and jump about in frantic efforts to escape. The trainer advances hand over hand on the rawhide lasso till the head is reached. They are then sometimes given a little salt, of which they are fond; they are then led about for some time or tied to a post to, accustom them to confinement and, the lesson over, again released. This is repeated day by day, and when sufficiently tamed they are harnessed and in the same manner gradually accustomed to draw light loads. This takes a long time and persistent work. They should not be worked before they are three years old. At six or seven they reach their prime and then gradually decline.



The Eskimo selected by the government as apprentices to learn the art of breeding reindeer from expert Lapp reindeer-men enter into an agreement to remain from two to five years, or until sufficient skill to handle a herd is acquired.¹ This affords some idea as to the time required for a man to develop into a herder.

Although the reindeer is the only species of the deer family that has been brought into the state of domestication, there are many examples known of other members of the family *Cervidae* which develop a great adaptability to domestication and have been tamed to a high degree. Yet domestication has succeeded only in the case of the reindeer. The efforts to raise other kinds of deer are interesting to the student of reindeer-domestication as affording an object-lesson and showing us the possibilities in the initial stages preceding the state of true domestication.

All of the deer family are easily tamed. The moose has often been reared and tamed in this country; but I know of no systematic attempt to domesticate them, nor have I ever heard of their breeding in domestication. They have been sometimes broken to the harness and proved themselves able to draw good loads; and yet I know of no regular effort that has been made to reduce them to servitude. When tamed, they are reasonably docile, except the males during the rutting season, when, as might be suspected, they become ferocious, and should be kept in close quarters where they can do no harm. If castrated young, and early taught obedience to man, we may not doubt that they would readily submit to his dominion, and their great strength would give promise of useful

¹ *Ibid.*, p. 128.

beasts of draught, especially in countries where deep snows prevail, through which they pass with facility where ordinary cattle could make no progress.¹

A highly interesting notice on deer-farming has been written by D. E. Lantz.² In the United States, the wapiti or Rocky Mountain elk (*Cervus canadensis*) and the Virginia deer (*Odocoileus virginianus*) are managed and reared in enclosures, chiefly for profit in the sale of venison; but also the desire to preserve our vanishing game has caused the confinement of small herds under private ownership in many places. The elk readily adapts itself to any environment. It proves especially useful in clearing out underbrush from thickets, in which they are more useful than goats, since they browse higher. The increase of elk, while kept in preserves with surroundings as nearly natural as possible, is equal to that of cattle: fully ninety per cent. of the females produce healthy young. The male elk is ordinarily docile, but in the rutting season the older ones often become ill-tempered and dangerous. The remedy for viciousness is castration, the effects of which are that the animal is made docile, and its value for venison is greatly enhanced. The stocking of parks and preserves with deer merely for sport or aesthetic purposes appeals much more to a sensitive mind. The idea of raising beautiful animals like deer merely for slaughtering purposes is revolting and unsportsmanlike, and for this reason has no future. A vigorous propaganda in favor of the destruction of some of our finest game-animals, which we have every reason to wish to see preserved, should be combated in all ways possible.

Examples of tame deer can be gathered from all parts of the world and from all times. In ancient Italy herdsmen reared does (*caprea*) on sheep's milk, and the wealthy Romans were fond of keeping them in their parks together with chamois and gazelles.³

¹ J. D. Caton, *The Antelope and Deer in America*, p. 277. This author, further, has interesting notes on efforts to tame caribou, elk, and other deer.

² "Deer Farming in the United States," published by the U. S. Department of Agriculture, *Farmer's Bulletin* 330 (Washington, 1908), p. 20. Compare also the same author's "Raising Deer and Other Large Game Animals in the United States," published by the U. S. Department of Agriculture, *Biological Survey, Bull. No. 36* (Washington, 1910), p. 62.

³ O. Keller, *Tiere des classischen Altertums*, p. 103.

Tame stags are frequently mentioned by Greeks and Romans. Sertorius owned in Spain a white deer, which, he made the people believe, communicated prophesies to him. Vergil¹ tells how a stately stag was bathed, combed, and adorned with flowers by Silvia, the daughter of the head pastor Tyrrhus, and how the animal became accustomed to the master's hand and table. In art, neck-collars and girth are repeatedly represented on stags. Apollo, Artemis, and Amor drive in chariots drawn by stags or deer. Heliogabalus possessed a chariot pulled by four powerful stags; and Aurelian, in his triumph over Zenobia, drove with a team of four tame stags which had once belonged to a king of the Goth.² Columella³ says that wild animals, like roes, antelopes, stags, and boars, are kept either for one's pleasure or for sale and profit. In the former case, any hedged place near one's homestead is sufficient, and the animals receive food and drink from one's hand; a plot of woodland with running water, walled around or fenced with pallisades, must be set aside for the game.

The genus *Dama*, which originally appears to have been restricted to the Mediterranean countries and Persia, has been introduced into western and central Europe, where it exists in a semi-domesticated condition as far north as the British Islands and the south of Sweden.

Owing to long domestication [read "taming"], the fallow deer of the British parks frequently display great variation from the original type of coloration, and a uniformly dark brown breed has been long established, while white or whitish varieties are far from uncommon.

Tamed deer were kept and fed by the hermits of ancient India. The deer-park near Rājagriha in which Buddha used to dwell is familiar to all readers of Buddhist literature. The kings of India built special stables for deer on the west side of their palaces.⁵

West of Tokmak the Turkish Khans of the seventh century maintained a summer residence with a park of tame harts provided

¹ *Aeneis*, VII, 483.

² Keller, *l. c.*, p. 90; and *Antike Tierwelt*, vol. I, p. 278.

³ *De re rustica*, IX, 1.

⁴ R. Lydekker, *Catalogue of the Ungulate Mammals in the British Museum* (London, 1915), vol. IV, p. 229.

⁵ B. K. Sarkar, *The Sukranīti* (Allahabad, 1914), p. 30.

with bells and rings,—in the words of the Buddhist pilgrim Hsüan Tsang, “familiar with men and not fleeing at their sight.” The Khan, being very fond of them, forbade his subjects to kill them on pain of death without remission.¹

The Island Mijo, or Aki-no Mijo (so called from the neighborhood of the province Aki), is famous for a particular breed of deer, which they say are very tame and familiar with the inhabitants. It is contrary to the laws of the country to chase and to kill them.²

In several places of the Altai, the maral (*Cervus elaphus*) is reared in captivity in consequence of the large demand for its antlers on the part of the Chinese, who are said to pay as much as 150 rubles for a pair, and employ it for medicinal purposes. Taming and feeding the animals are said to be easy; the antlers are cut off in their third year, the operation being without harm for the animals.³ The Chinese have many stories in regard to tame deer, which were even used for drawing carriages. In mythology, gods and fairies ride on deers' backs.⁴ Some tribes of Formosa practised the capturing of harts alive, and dexterity in this feat was regarded as a manly virtue highly extolled by folk-songs.⁵

It is not necessary to multiply these examples. Those given illustrate sufficiently the fact that many species of deer exhibit a high degree of adaptability, and that in diverse parts of the world and at different times efforts have been made to tame them and to keep them as pets in parks mainly for aesthetic reasons. In the case of every domestication, the animal deserves as much credit as man; an animal unqualified for the status, and without sympathetic instincts for man, cannot be domesticated.

¹ S. Julien, *Mémoires sur les contrées occidentales*, vol. I, p. 14; S. Beal, *Records of Western Countries*, vol. I, p. 28; Chavannes, *Documents sur les Tou-kiue (Turcs) occidentaux*, p. 120.

² E. Kaempfer, *History of Japan* (Glasgow edition), vol. I, p. 200.

³ A. Printz, *Erman's Archiv für wissenschaftl. Kunde von Russland*, vol. xxv, 1867, p. 294; A. Jarilow, *Beitrag zur Landwirtschaft in Sibirien*, § 319.

⁴ An interesting article on Chinese notions of cervines is by M. Cibot, “Notice sur le cerf,” in *Mémoires concernant les Chinois* (Paris, 1788), vol. XIII, pp. 402-408.

⁵ K. Florenz, “Formosanische Volkslieder,” *Mitt. D. Ges. Ostasiens*, vol. VII, (1898-99), p. 122.

The following case presents a good example as to how primitive man may have managed to get possession of wild reindeer alive. The ancient Kitan and Jurči (Niüči) of Manchuria had a peculiar method of hunting deer by imitating its belling, and killing with arrow-shots the animal thus allured.¹

A lively description of this manner of hunting was given in the eighteenth century by C. Visdelou² as follows:

The Niüči were always celebrated for a sort of hunting peculiar to their nation. The same method is still appropriate solely to the Manchu. These tell the following story as a well-substantiated fact. Briefly before the rutting-season each stag will establish a seraglio of does and occupy a stretch of forest or mountain. After this division there are stags left who either did not receive their share or were robbed of their spoils. Each is intent on acquiring a territory by right of conquest. He invades the district of one of his neighbors. On entering it he utters a cry as a challenge for combat. A courageous owner does not await another call, but will pounce on the intruder instantaneously. Meanwhile the does will line themselves up in two rows to watch the duel. The adversary being put to flight or thrown to the ground, his does will pass over to the victor. The Manchu take a stag's head with the antlers, hollow it out, and place it over their own head. With a hidden decoy whistle they imitate the call of a stag so perfectly that the animal is deceived. They crouch in the thicket, and at the sound of the whistle the stag comes out in the open for an attack, sometimes so precipitately and furiously that the hunter has no time to make use of his weapons. He who is thus surprised is usually lost and torn to pieces. During his youth the Emperor K'ang-hi once risked his life on such a hunt, which takes place annually. The Manchu affirm that the best, largest, and strongest

¹ H. C. v. d. Gabelentz, *Geschichte der grossen Liao*, pp. 98, 154; Chavannes, "Voyageurs chinois chez les Khitan," *Journal asiatique* (mai-juin, 1897), p. 404; also Klaproth, *Tableaux historiques de l'Asie*, p. 90. In the latter's translation appears a zoölogical puzzle by which no one as yet seems to have been struck. According to Klaproth, the Jurči subsisted on the flesh of the stags, and prepared an intoxicating beverage from the milk of the does. The question as to how it was possible to milk a wild animal did not alarm the learned sinologue. In fact, the Chinese author, the traveler Hu Kiao, who lived among the barbarians of the north from 947 to 953, did not write this nonsense. The text of the *Wu tai shi* (ch. 73, p. 3 b), in which his account is embodied, simply contains a misprint (*mi* 麋, *Cervus davidianus*, instead of *mi*, "millet"); and the passage means, as rendered by Chavannes, "They make a fermented beverage from a decoction of millet." Schlegel (*T'oung Pao*, vol. III (1894), p. 141), citing the same passage after Ma Tuan-lin, arbitrarily takes the term *mi* in the sense of "reindeer," and thinks that the Jurči distilled an alcoholic beverage from reindeer's milk. As to the other animals mentioned by Hu Kiao in this region, the "wild dogs" (*ye kou*), I believe, represent *Canis procyonoides*.

² In d'Herbelot, *Bibliothèque orientale* (La Haye, 1789), vol. IV, p. 292.

stags are brought in from these hunting-expeditions, and that there is no finer sight than the majesty, pride, and intrepidity of these animals when coming forward to fight,—a quality less conspicuous at other times.

G. Radde¹ reports that during the rutting season the hunters of the Sayan, Baikal, Yabloko, and Chingan mountains avail themselves of slightly curved horns made from fir or larch wood;² on the left bank of the Amur they use also the thick, hollow stems of the Kongola-Umbelle (*Calisace daurica*). At this time the stag is not timid, and approaches the hidden sportsman at a short distance. Old stags, however, do not easily accept this challenge to battle, and are said to discriminate well between the call of the hunters and their own kind. The Mongols avail themselves of a whistle (called *urum* or *urum-dal*) to attract the hart, or also imitate his cry.

According to the reminiscences of the Lapp, they received their domesticated reindeer from the wild animal. Johan Turi narrates in his autobiography (p. 64),

In ancient times there were many wild reindeer, and there was no one who cared to guard reindeer. And the Lapp learned how to make the wild reindeer feel safe, so that they remained in his herd. When a wild reindeer has joined the herd, it is necessary to go cautiously around the herd and to allow it to walk ahead quite a distance, that the wild reindeer does not know that men are near. When the wild animal has visited the herd, it is familiar with it, and does not move away even when seeing men. Not all wild reindeer, however, are equally bold; some never become confiding, however long they may remain with the herd, but some it takes only little time to become accustomed to reindeer and man; neither does it run away unless it should drift into a troupe of wild reindeer; in this case it follows the wild ones. The timid ones can never be tamed. The wild ones are much larger than the domesticated stock, and more glossy, as though having silver hair. A few of those which cannot be rendered tame were obtained in this manner, that a wild reindeer bull visited the herd in the rutting season. And when a wild reindeer is in the herd, the latter need not be guarded.

Johan Turi continues (p. 65),

A Lapp sojourned in the vicinity of Koutokäino, and he would annually

¹ *Reisen im Süden von Ost-Sibirien*, vol. I, p. 284. Radde has transcribed the call in notes. See also A. von Middendorff, *Sibirische Reise*, vol. IV, p. 1390.

² According to the *Ta Kin kuo chi* (ch. 39, p. 1; written in 1234 by Yü-wen Mou-chao), the Jurči made horns from birchbark, on which they produced sounds like *yu-yu*, in order to allure the harts (*mi-lu*), and then to shoot them with bow and arrow. *Yu-yu* is a Chinese term of endearment for a tame deer.

allow the reindeer to mate on a strip of land in the Elf. A wild reindeer always appeared during the mating-season for several years, and he did not kill him. Somebody, however, killed him at last. And the Lapp regarded this as a much more deplorable loss than if it had been one of his own bulls. Yet he received offspring from the wild reindeer. His deer became as glossy and slender as wild reindeer; it was quite extraordinary reindeer, and every one envied him for his reindeer, since they were much finer than others.

While this account proves nothing for the origin of the domestication, it shows clearly that the old stock was renewed and recruited from wild material, and that a great number of wild animals were gradually absorbed by the Lapp. In this respect also Ohter's account given above (p. 95) is of fundamental value.

Aside from battues, the Samoyed have conceived a peculiar method of capturing wild reindeer. They train four or five tame, usually female, reindeer in such a manner that they walk together around the hunter in a certain order. One walks ahead, being held by a rope many fathoms long, the others going at the side of the hunter, who fastens to his girdle the ropes of all animals. The hunter, clad in reindeer-skins and bending low, steals along as near as he can to the wild herd, and picks out the best specimen for his shot. During the rutting season the Samoyed select a strong, ungelded buck, and look for a wild herd. When such is sighted, slings are laid around the antlers of the buck and attached by means of loose bast. Thus he is set on the wild herd. The wild stag, being aware of the alien rival, challenges him to a duel. During the brawl, his antlers become entangled in the slings of the tame pseudo-opponent, who will press his antlers toward the ground, and thus hold the adversary till the hunter arrives.¹

The Ostyak have developed a similar method, or rather adopted it from the Samoyed. They fasten to their tame deer a strap between the upper tips of the antlers, and allow them to disperse near a herd of wild ones. These rush on the strangers, and, during the struggle, entangle their antlers in the straps prepared, being held till the arrival of their captors.² A similar method prevails

¹ P. S. Pallas, *Reise durch verschiedene Provinzen des russischen Reichs* (1776), vol. III, p. 91.

² A. Erman, *Reise um die Welt*, vol. I, pt. I, p. 653.

among the Amur tribes. In the autumn and the spring the native hunters indulge in the chase of wild reindeer by means of tame ones. The latter are let loose, but held with a long strap by the hunter, who cautiously follows behind in their trail. According to his will, the reindeer is made to pasture, to lie down, to stand up, and to turn round in this or that direction. The skilful hunter can thus slay many wild deer before his presence is suspected by the herd.¹ V. Jochelson² has described the same procedure for the inhabitants of the Kolyma district, where the decoy animal is known under the name *man'sčik* (probably from Russian *manit'*, "to lure"), in the language of the Lamut *ondadá*. Thus the practice is universal throughout Siberia. This method may illustrate how the decoys of Ohthere were used (p. 95), and how primitive man at all times understood how to add a fresh supply to his stock. What method he employed in detail for breaking his deer certainly escapes our knowledge. Some of his methods have been alluded to, as gelding and the imitation of processes gained by experience with other domestications.

An interesting problem is whether reindeer-driving is to be conceived as an imitation of the method of driving on dog-sledges. In regard to the latter we possess unfortunately little historical material. We have seen that dog-sleighs were known among the Kirgiz in the thirteenth century (p. 111) and in northwestern Siberia in 1499 (p. 97), and that they even extended to the west of the Ural in ancient times.³ Driving with dogs is practised throughout Siberia. As is well known, the dog was originally the sole domestic animal kept by the so-called Palaeo-Asiatic peoples, the Ainu, Gilyak, Kamchadal, Yenisei-Ostyak,⁴ Yukagir, Koryak, and Chuk-

¹ Grum-Gržimailo, *Opisanie Amurskoj Oblasti*, pp. 334, 335.

² *Očerk ziv'opromyšlennosti i torgovli m'axami v Kolymskom okrug'ä* (Sketch of the Animal Industry and Fur Trade in the District of Kolyma), p. 44.

³ These data escaped L. von Schrenck (*Reisen und Forschungen im Amur-Lande*, vol. III, p. 488) in his discussion as to the time when the Russians became acquainted with dog-driving; he does not go beyond the seventeenth century. S. von Herberstein (*Notes upon Russia*, vol. II, p. 46) mentions large dogs used as beasts of burden, "which are very useful for this purpose, with which they convey baggage in carriages, in the same manner as will be hereafter described in speaking of the deer."—Compare above, p. 99.

⁴ J. Klaproth, *Asia polyglotta* (Paris, 1823), p. 167, stated that the Yenisei-Ostyak

chi; and dog-sleighs represent the exclusive means of land transportation among these tribes. The same condition is found among the Eskimo, while the tame reindeer is unknown to them. From this wide geographical distribution covering the Old and New Worlds it necessarily follows that the employment of the dog for the sledge is far older in time than that of the reindeer for the same purpose. Although strictly mathematical proof cannot be put forward, the ethnographical facts well warrant the conclusion that the reindeer-sledge is based on the dog-sledge, and that reindeer-driving sprang into existence as a perfectly conscious and volitional imitation of driving with dogs. This being the case, it is clear that the reindeer people must have profited from the experiences of the dog-drivers, and reproduced many of their methods.¹

subsist on fishing, hunting, and to a small extent reindeer-breeding. Recent authors say nothing about this point, but mention only fishing and hunting, with the dog as the exclusive domestic animal (S. Patkanov, *Essai d'une statistique et d'une géographie des peuples palae-asiatiques* (St.-Petersbourg, 1903), p. 9). The peculiar language of this group has been studied by M. A. Castrén, *Versuch einer Yenisej-ostjakischen und kottischen Sprachlehre* (St.-Petersburg, 1858). G. I. Ramstedt "Ueber den Ursprung der sog. Jenisej-Ostjaken," *Journal de la Société finno-ougrienne*, vol. xxiv, 1907, pp. 1-6, has made the singular attempt to compare the Yenisei-Ostyak numerals from two to ten with those of Tibetan and Chinese, and to proclaim on the basis of this result the Yenisei-Ostyak as a branch of the Indo-Chinese family. The alleged coincidences are by no means convincing, and either do not exist at all, or are mere resemblances on paper; not phonetical, however. It would hardly be worth while to call attention to this fantasy if the author were not a good philologist, whose contributions to Mongol phonology and dialects command respect.

¹ Two extraordinary statements in respect to reindeer-driving are made by the Jesuit Philippe Avril, *Travels into Divers Parts of Europe and Asia* (London, 1693), p. 172, English translation of his *Voyage en divers états d'Europe et d'Asie* (Utrecht, 1673, and Paris, 1692). "To make the reine-deer go more swift, they tie a great dog behind, that scaring the poor beast with his barking, sets her a running with that speed, as to draw her burthen no less then forty leagues a day." "But that which is more wonderful as to these sort of sledds, they are also driven along by the wind sometimes over the land cover'd with snow, sometimes over the ice of frozen rivers, as our vessels, that sail upon the sea. For in regard the country beyond Siberia is open and extremely level as far as Mount Caucasus, the people who inhabit it making use of this advantage to spare their beasts, have so order'd their sledds, as either to be drawn along by the reine-deer, or else to carry sails, when the wind favours 'em." I cannot find any confirmation of this dog contrivance and of sail sledges in any other source. Avril was commissioned by the then King of France to discover a new way by land into China, left Marseilles in 1664, reached Moscow, where he

The advantages of reindeer over dog keeping are obvious. The reindeer feeds itself, the dog must be fed. In traveling, food must be carried for the dogs. The maintenance of dogs develops into a burdensome task. In case of emergency the reindeer will furnish food to his master.

As soon as the wind blows a little, the dog cannot travel; especially is this so if the wind happens to be in the face. The deer does not mind the wind in the least, from whatever direction it comes; it rather enjoys travelling against the wind. It costs nothing for feed; it faces all weather, and makes its way where the driver can hardly walk without snowshoes. It goes uphill and downhill alike. Trail or no trail, it will haul its two hundred pounds or more day after day, even week after week.¹

It is not to the point that, as asserted by G. Mortillet² after K. Vogt, reindeer-breeding is impossible without the use of the watchdog. In fact, only the western group of reindeer-tribes—Lapp, Wogul, Ostyak, and Samoyed—have their herds managed by dogs; while neither the Tungus nor the Koryak and Chukchi have their reindeer chaperoned by dogs; on the contrary, they keep these away from the herds.³ With me it is not an open question, as stated by Bogoras, whether reindeer-breeding was begun with dogs or without them. The dog, in my estimation at least, had nothing to do with the incipient process. He is merely an incidental accessory, being transferred from his office previously held in other herds to the guarding of reindeer long after the latter's domestication was completed.

As regards the employment of the reindeer for riding purposes, there can be no doubt that it existed at least as early as the thirteenth century in the Baikal region (p. 107). The only moot point was compelled to return, and traveled by way of Warsaw to Constantinople, reaching Toulon in 1670. The information supplied by him on Siberia was gathered in Russia, for the most part from oral accounts. In his biography (*Biographie universelle, Supplément*, vol. LVI, p. 605) it is said, "Ce qu'il dit sur l'histoire naturelle montre que ses connaissances en ce genre n'étaient pas très étendues." Nevertheless his book is full of interest and teems with curious information (see, for instance, *T'oung Pao* (1916), p. 363).

¹ *Fourteenth Annual Report on Introduction of Domestic Reindeer into Alaska* (Washington, 1905), p. 105.

² *La Préhistorique*, p. 439.

³ Bogoras, *Jesup North Pacific Expedition*, vol. VII, p. 71.

is whether this practice is primarily due to the southern Samoyed or to Tungusians.¹ Since the northern Samoyed do not ride the reindeer, it would seem that the claim of the Tungusians merits preference; but this conclusion would be fallacious. The northern Samoyed are mentioned as early as 1096 in the Russian chronicle of Nestor, and it is therefore conceivable that the northward migration of this stock was an accomplished fact at a time when the reindeer was not yet trained to the saddle in their southern home; or, in other words, that the riding of the reindeer in the Baikal region came into existence after the separation of the Samoyed tribes, and for this reason never reached the northern group. Thus the question as to the particular people which first mounted the reindeer must remain undecided; assuredly it was a tribe that had gained some experience with horses. It is said that it takes the reindeer only a very short time to become accustomed to the saddle.²

Although truly in a state of domestication, it can by no means be asserted that the reindeer has been brought fully under the control of man. On the contrary, the reindeer controls man to a much higher degree than man has sway over the animal, and in fact determines his whole manner of life. In this respect reindeer-keeping differs radically from cattle or horse breeding. Cattle and horse have been subordinated to human will so completely that they cannot subsist without being provided by man with fodder and shelter. They share man's habitation, and stable-feeding has made them the close associates and friends of his home. To the reindeer man does not furnish lodging and board. It remains independent, and pursues its natural instincts along the question of nutrition; it is not sheltered from the inclemencies of the weather by house or tent, but spends the night like its wild congener. In short, it makes and lives its own life, only to answer its master's call when occasion for labor arises. It performs its duties willingly

¹ N. V. Latkin, *Yeniseiskaya Guberniya*, p. 169, includes also the Dolgan and Yakut among the reindeer-riders. If this is the case, it is certainly due to Tungusian influence. An example of reindeer-riding Yakut is found in the autobiography of the Yakut Uvarovski (O. Böhlingk, *Sprache der Jakuten*, pp. 26, 49).

² Latkin, *l. c.*

and submissively; but as soon as the short working-hours are past, it demands its freedom, and must be released for grazing and browsing: it cannot be held in socage indefinitely. The reindeer's life is bound to a well-defined geographical area with specific floristic characteristics, and it cannot be removed to other quarters without its existence becoming endangered. Individuals taken into our zoölogical parks, even if provided with moss, do not thrive long, and are usually doomed after a few years; while transplantations of herds into Switzerland, for instance, have proved failures. The reindeer cannot live in captivity, it cannot be acclimated to uncongenial zones, and will never approach that state of true domesticity attained in cattle and horse. If domestication be taken in the true sense of the word, "habituation to home-life," the reindeer has certainly not reached it, quite in conformity with its master.

In view of the reindeer's economic independence, the interesting question arises: What forces bind the animal to man? If it receives from him neither food nor shelter, by what factors is it induced to maintain such a seemingly unprofitable association? Indeed, the reindeer's position is singular. Examining other domestic breeds, we plainly recognize the foundation of their social contract with man, which is based on an unwritten law of reciprocity, that on both sides has developed into the quality of faithfulness. Dog, cat, and swine have reserved to themselves a certain degree of independence in the choice of their diet, and if forsaken by man, or even while under his care, may hunt for a meal on their own initiative; nevertheless they will always appreciate more what is offered them by man. Reindeer are fond of salt and sugar, and a bit of these articles may accelerate their run; but they are so rarely given to them, that this could hardly be thought of as an inducement for them to keep up companionship with man.¹ It may be, then, that it believes in man as a superior being, that it trusts in his power and strength, and looks up to him as his guardian from perils threatening from wild animals, chiefly its arch-enemy

¹ Hahn, *Haustiere*, pp. 558-559, regards the animal's craving for salt, satisfied by human urine, as the strongest bond that binds it to the service of man,—doubtless an exaggeration.

the wolf. But even this argument, weighty as it may be, does not seem to me sufficient to explain the whole scale of the reindeer's relation to man. It seems to me that psychic qualities both in the animal and in man must be made responsible for the final result. There is man's aesthetic pleasure in animals, and the entire deer family is attractive to every human soul. This sympathy is doubtless reciprocated by the reindeer. Above all, there is the social instinct developed both in deer and man, and in the loneliness of the arctic regions these social bonds are doubtless intensified. The deer is a highly social creature, impressing its friendship on man. It is of gentle disposition, and is loved by children. Those of the Tungus are fond of decorating their riding-deer with ribbons to which are sewed glass beads or buttons.¹

Not much positive information is available in regard to feral reindeer. The Lapp, Johan Turi, in his fascinating autobiography (p. 40), speaks of the savage character of the bulls during the rutting season, when they even pounce on men, and observes that the "bulls of the wilderness" (that is, animals which have segregated from the herd and lived long in the wilderness without man's care) particularly are prone to attack people.

In accordance with the history of the domestication, the tending of the herd, and the care of everything connected with it, are everywhere the business of man. Among the Chukchi, labor is divided between man and wife in this manner: that all domestic affairs, inclusive of preparation of hides, yarn, and clothing, fall to the lot of woman; while man looks after the herd, harnesses or unharnesses the deer, and, if necessary, slaughters it. This is man's sole business, but his time is fully occupied with it.²

To dilate on the effects of reindeer-breeding is beyond the scope of this article. This would mean to set forth in detail the economic features of the culture of the tribes in question, which has been done in a number of excellent monographs. I should like to emphasize merely a single point; and that is, that in my estimation the reindeer-breeders have developed higher psychic qualities

¹ Pekarski and Tsv'atkov, *Očerki byta Priayanskix Tungusov*, p. 39.

² G. Maydell, *Reisen und Forschungen im Jakutskischen Gebiet Ostibiriens*, pt. 1, pp. 186-187.

than the Palaeo-Asiatic dog-breeders, owing to the fact that the latter, as agreed upon by all observers, have no inward relations to their dogs, and their savage dogs lack all superior traits of the civilized dog, while there is mutual affection between man and reindeer. I do not believe in generalizations nor in comparisons, still less in dogmas of racial superiority and inferiority or of good and evil, and I am very far from extolling the reindeer tribes at the expense of the dog-breeders. Of these the Gilyak and Ainu are known to me from personal experience, also the Olča and Golde on the Amur, whose culture is partially based on the maintenance of dogs. I gained a deep respect and sympathy for these people, for their manliness and good nature, their hospitality, and their intellect. I felt more at home, however, with the reindeer-breeding Tungusians, who are more alert, open-minded, straightforward, and psychically more developed, and I found that A. von Middendorff was perfectly right in styling them the aristocracy of Siberia. There can be no doubt that constant intercourse with an animal as noble, civil, and civilized as the reindeer has a psychical value, and exerts a beneficial and ennobling influence on the hearts of the people. Let me quote the experience of a Finnish author. Among the Lapp, songs are particularly cultivated by the reindeer-breeders; and in the opinion of Armas Launis,¹ who has published a comprehensive collection of such songs with their musical notations, they may be regarded as the originators of the songs which receive their natural explanation from the life of the herder. At home he is reserved and taciturn, and he scarcely sings otherwise than during his sojourn on the tundra, where he tends his herd. Confronted with the wide panorama of lakes and the blue mountains bordering the horizon, he will remember a good friend or brood evil against an enemy. The reminiscence assumes shape in words and tones, and a tune thus arises on the subject of his thought. While he looks over his herd with a feeling of content, he gives vent to his sentiments, and, muttering the words "čäbba ællo čäbba ællo" (handsome herd, handsome herd), he will finally compose a melody in praise of his flock.

¹ "Lappische Juoigos-Melodien," *Mémoires de la Société finno-ougrienne* (Helsingfors, 1908), vol. XXVI.

Hahn¹ says that the economic value of the reindeer has been overstated, as would follow from the fact that it is restricted everywhere to the aborigines; while Europeans did not take to its breeding, even there, where the animal would be important. Again he thinks that "the reindeer is not sufficient to man of European descent and culture, or that the latter has not the patience required for it; in this point he is surpassed by the 'savage.'" But Ohthere, the Norseman, was a European (p. 94). The Russians, when advancing and settling in northern regions, where horses do not thrive, easily took to reindeer-breeding. P. S. Pallas² reported in 1772, in regard to the district of Obdorsk, that horses imported there did not live a year, and that the reindeer-herds,—which, despite numerous diseases and wild animals, increase rapidly—form a not unimportant wealth both of the Russian and Pagan inhabitants of those northern countries.³

Erroneous also is Hahn's statement that

the reindeer has never followed the European, as particularly shown by the introduction in 1770 into Iceland of reindeer which were supposed to give new domestic animals to that poor country.

What was introduced into Iceland in 1771 and 1777 (not in 1770) were not domestic, but wild reindeer from Norway, which were gradually shot, and are now almost exterminated.⁴

The reindeer introduced into Alaska at the end of the last century are as useful to the whites as to the Eskimo. Says Dr.

¹ *Haustiere*, pp. 264, 267.

² *Reise durch verschiedene Provinzen des russischen Reichs*, vol. III, p. 23.

³ The Russian nomenclature relating to the reindeer, chiefly in the dialects of northern Russia, is borrowed from Finno-Ugrian languages: thus *pyžik* (young reindeer, fawn), that already occurs in Old Russian, from Syryän *pež*, Wotyak *pužey*, Wogul *pežka*, Ostyak *peži*; *vážatka* or *váženka* (doe) from Syryän *važenka*, Lapp *važ*, *važa*; to the same root belong in the dialect of Archangel *vačegal'* (to tend a reindeer-herd), *vačuga* (reindeer relays), *vačužn'a* (reindeer-herd); *hora* (reindeer-bull) from Samoyed *hora*, Syryän *kora*; *girvas* (male reindeer) from Finnish *hirvas*; *gigna*, *higna* (leash in the reindeer-harness) from Finnish *higna*; *loima* (a herd of reindeer) from Finnish *lauma*, etc. (compare R. Meckelein, *Die finnisch-ugrischen Elemente im Russischen*, p. 20).

⁴ See the interesting account of A. Gebhardt (after Th. Thoroddsen), "Die Rentiere auf Island," *Globus*, vol. 86 (1904), pp. 261-263.

Jackson, the father of this new economic movement, on this point:¹

The industrial pursuit which nature has mapped out for the native population of arctic and subarctic Alaska is the breeding and herding of reindeer and the use of the deer as a means of transportation and intercommunication. During the past season the influx of miners into the Yukon region has made a very urgent call for reindeer for freighting-purposes. In the original plan for the purchase and distribution of reindeer, reference was mainly had to securing a new food-supply for the famishing Eskimo; but it is now found that the reindeer are as essential to the white men as to the Eskimo. The wonderful placer mines of the Yukon region are situated from 25 to 100 miles from the great Yukon River. The provisions brought from the south and landed upon the banks of the river are with great difficulty transported to the mines. So great was the extremity last winter, that mongrel Indian dogs cost \$100 to \$200 each for transportation purposes, and the freight charges from the river to the mines, 30 miles, ranged from 15 to 20 cents per pound. The difficulty experienced in providing the miners with the necessaries of life has demonstrated the necessity of reindeer-transportation, and that the development of the large mining interests of that region will be dependent upon the more rapid introduction of reindeer for freighting. There are no roads in Alaska, and off of the rivers no transportation facilities to any great extent. In the limited traveling of the past, dogs have been used for that purpose; but dog-teams are slow, and must be burdened with the food for their own maintenance. On the other hand, trained reindeer make in a day two or three times the distance covered by a dog-team, and at the end of the day can be turned loose to gather their support from the moss, which is always accessible to them.

On the other hand, it is stated,

The ordinary white man is unwilling to undergo the drudgery of herding in that rigorous climate, and unwilling to work for the small compensation that is paid for such services. He can do better. . . . With the increase of domestic reindeer in Alaska, it will become possible for white men to own large herds; but the men that will do the herding and teaming will always be Eskimo and Lapp.²

Hahn's gloomy prophesy of the ultimate extinction of the reindeer jointly with the "miserable" tribes of the Ostyak, Wogul, and Samoyed, has happily not been fulfilled. He who is but superficially posted on the subject knows that the Samoyed are not a dying people, but vigorously spread and thrive.³ So does

¹ *Report of the Commissioner of Education for the year 1895-96* (Washington, 1897), vol. II, pt. 2, p. 1454.

² *Report of the Commissioner of Education for the Year 1903*, vol. II, p. 2375.

³ See, for instance, W. Crahmer in *Zeitschrift für Ethnologie* (1913), p. 543.

the reindeer. It is protected by the Russian government, and the study of the improvement of the economy has been entrusted to special commissions. The reindeer is gaining ground, and will claim more importance and attention in the future. It has conquered Alaska and parts of Canada. The successful introduction of domestic reindeer into Alaska has led to their introduction into Newfoundland. Dr. Grenfell, who in 1892 organized a medical mission among the fishermen off the shores of Newfoundland and Labrador, on reading the U. S. reindeer reports, became convinced that he had to have reindeer for his winter trips, and January 7, 1908, landed safely three hundred head at the village of Cremeliere, two miles from St. Anthony, on the northern coast of Newfoundland.¹

The ethnologist will watch with interest the gradual transformation of the Alaskan Eskimo into reindeer-breeders.² History repeats itself: it is the same process that reshaped the life of the Chukchi and Koryak. The introduction in 1890 of reindeer into Alaska was inspired by a desire to provide a new and more permanent food-supply for the half-famishing Eskimo. Up to 1902 there were sixty individual holders of domestic reindeer in Alaska, forty-four of these being Eskimo, the majority of whom had served a five-years' apprenticeship and gained a competent knowledge of the management and care of reindeer. In 1903 sixty-eight Eskimo and one Indian owned 2,841 deer. From the 1,280 Siberian reindeer imported between 1892 and 1903, and from their natural increase, 7,983 fawns have been born in Alaska.

The Eskimo has always been skilful in driving dogs, and now, under instruction, is proving equally skilful in driving reindeer, and upon various occasions, when the opportunity has offered, has invariably demonstrated his ability to successfully transport with reindeer mails, freight, and passengers between mining-camps.³

¹ *Sixteenth Annual Report on Introduction of Domestic Reindeer into Alaska* (Washington, 1908), p. 42.

² Compare E. W. Hawkes, "Transforming the Eskimo into a Herder," *Anthropos*, vol. VIII (1913), pp. 359-362.

³ From Dr. S. Jackson's report, in *Report of the Commissioner of Education for the Year 1903* (Washington, 1905), vol. II, p. 2374.

In view of the opportunities and facilities granted in Alaska, it is a matter of surprise that biologists have not yet seen fit to take up the study of breeding problems in connection with the reindeer, either for theoretical purposes or with a view to improving the races. We are anxious to know, for instance, why the Tungus reindeer is larger and sturdier than that of Lapland, and why most of the wild deer are larger than the domesticated. As to the question of color variation in the domestic stocks we have merely vague descriptions of laymen, and the differentiations of the various stocks have not yet been determined scientifically. Likewise the following observation would offer a problem to the biologist.

No deterioration in the herds on account of inbreeding has been noted. On the contrary, the chief of the Alaska division maintains that the reindeer now in Alaska are larger animals than those which comprised the original stock imported from Siberia, that Alaska affords a better range than Siberia, and that the climate is better adapted to the reindeer industry. The herds in Alaska average more than seven hundred reindeer each, so that the danger of inbreeding cannot be serious. The introduction of wild caribou into some of the herds has increased the size of the reindeer in those herds.¹

¹"Report on the Work of the Bureau of Education for the Natives of Alaska, 1913-14," p. 10 (1915), *Bulletin*, No. 48.

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